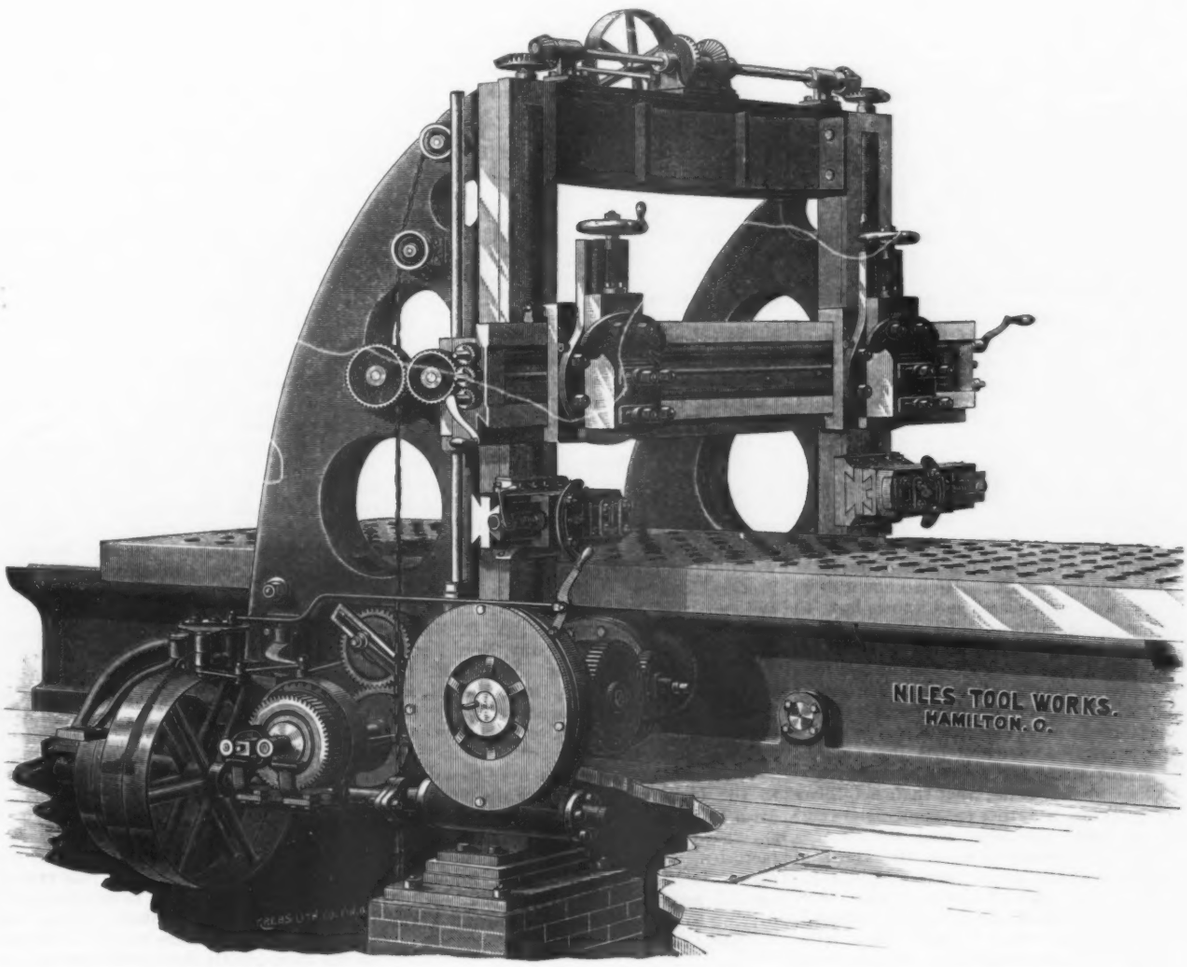
THE IRON AGE

THURSDAY, OCTOBER 10, 1889.

Seventy-Two-Inch Planing-Machine.

The machine we here illustrate, built by the Niles Tool Works, of Hamilton, Ohio, planes 72 inches wide and 72 inches high. The driving-shaft is placed in line with the bed, with the view of setting the machine lengthwise with the shop, parallel with the line-shaft. Power is transmitted through tangent gearing running in oil and perfectly noiseless in action. This method of driving affords a steady, uniform motion; the easily and gives the operator quick and perfect control over the movements of the table without using the counter-shaft shipper. The driving-pulleys and gearing are placed on one side of the machine opposite the operator, being entirely out of the way, but still completely under his control when standing at his usual position. The loose pulleys are bushed with brass. The feeds are automatic in all directions. They are positive, and take place in a very short distance of the travel of the table and before the commencement of the cut.



SEVENTY-TWO-INCH PLANING-MACHINE, BUILT BY THE NILES TOOL WORKS.

table reverses accurately and without shock or jar. All the gearing and rack teeth are accurately cut from the solid. The shafts are steel forgings of large diameter, with large and long bearings. The driving-shaft runs in bearings of the best wearing composition of copper and tin. The driving-pulleys are of large diameter and run at a speed to give the belts a velocity of 80 to 1 of the table, exercising great power and allowing the table to be reversed in a very short distance. The belts are shifted by a patent automatic belt-shifter, which transfers but one belt at a time, thereby preventing two belts running in opposite directions from being on the tight pulley at the same time, so that there is no slipping of belts to cause shrieking and jar of the machine. It is entirely disconnected from the feeding apparatus, therefore works

The machine may be provided with two heads on the cross-rail and with side heads on the uprights when desired. The two heads have independent feeds. When two heads are used the rail is extended so that one head can be run over entirely out of the way, and the other head have sufficient traverse to plane off the entire width of the machine. The amount of metal in the machine is ample, and is so distributed as to give rigidity and durability under severe service. The bed is thoroughly braced by box-girders throughout its entire length. Between the housings the bed is tied together in box form, making it particularly stiff at the point of greatest strain. The housings extend well back and are strongly braced. The cross-rail is cored out in the form of a box-girder and is very stiff. It is raised and lowered by power. The table is thick and the bed long in proportion. The counter-shaft pulleys are 22 inches in diameter and 6 inches face. The speed of the counter-shaft is 250 revolutions per minute.

The blocks are being prepared at Portsmouth Dock-yard for laying the keel of the first-class battle-ship Royal Sovereign. She is to be a barbette ship, 380 feet long by 75 feet beam, and will displace about 14,150 tons. Her machinery will indicate 13,000 horse-power under forced draft and 9000 horse-power under natural draft, which, it is expected, will drive her 17.5 knots an hour under forced draft and 16 knots an hour under natural draft. Her draft of water will be 27 feet 6 inches—the same as that of the Trafalgar. Her armament will be 4 67-ton guns, 10 6-inch breech-loading guns, 24 6-pounders and 3-pounder quick-firing guns, 5 torpedo-tubes above water and 2 submerged tubes. A belt of 18-inch armor 8½ feet deep will extend over two-thirds of her length. At the ends of the belt are traverse armored bulkheads, and a 3-inch steel deck is fitted above it, while a protective under-water deck extends from the armor belt to the bow and stern. The battery above the armor is protected by 5-inch armor and screen bulkheads. The freeboard at the end of the vessel is to be 18 feet and the hight of the heavy guns above the water is to be 23 feet.

THE MINING ENGINEERS.

MEETING AT OTTAWA.

Considering the very large membership of the American Institute of Mining Engineers, approaching as it does 2500, a very small number were registered when the first session was called to order Tuesday evening, October 1, in the Railway Committee room of the House of Commons, Ottawa. There was not a single member present then for whom it might be claimed that he represented great iron and steel manufacturing interests. We do not believe that their absence indicates a lack of interest in the work of the institute. We are inclined to attribute it to the fortunate circumstance that the revival in the iron trade has made our manufacturers and their engineers so busy that they are unable to leave their furnaces and their mills, even with the temptations which institute gatherings offer. On the other hand, however, the Canadian members were present in goodly numbers, so that when Dr. John Sweetland, chairman of the local committee, called the meeting to order the rooms of the Railway Committee were comfortably filled. B. T. A. Bell, secretary of the committee and editor of the Canadian *Mining Review*, of Ottawa, read letters of regret from Mayor Erratt, from Sir Hector Langevin, Minister of Public Works, and the Hon. A. S. Hardy, Commissioner of Public Lands of Ottawa. Dr. Sweetland in a few well-chosen words bid the engineers welcome, and then introduced the Right Hon. Sir John A. Macdonald. Canada's great statesman is a tall, vigorous man, whose advanced years—he is over seventy—are not betrayed except by a slight stoop, which, however, is characteristic of so many who tower above their fellows. His smooth-shaven face is strong, while his blue eyes often light with a merry twinkle. He is known to be a man who appreciates and knows how to tell a good story—a gift which he displayed in his brief address of welcome. He alluded to the fact that at one time the citizens on the other side of the border had widely shared the opinion of Voltaire that Canada is nothing but a region of ice and snow. A reaction has taken place, and now there are many Canadians who incline to the belief that their neighbors are growing altogther too appreciative and affectionate. He illustrated the changes which have taken place in the views of those across the border by relating the experience of two Americans who were traveling from Windsor, Ont., eastward, on their first visit. After a few miles of travel the one remarked to the other that after all Canada was not so bad a country, to which a reluctant assent was given. A few miles of additional journeying elicited the remark that it was a good country. After a long pause came more emphatically the judgment: "It is a very fine country; we must have it," to which the other replied: "I have no objection to take the country, only for the people in it." The Premier expressed the belief that on the other side of the line they are quickly approaching the point where they are willing to take the country even with the incubus of its population. Extending to the institute a hearty welcome, he quoted the response to a toast attributed to Sheridan, who was invited to participate in the festivities commemorative of the successful completion of a great industrial enterprise at Manchester: "Dam your rivers, sink your canals and blast your mines." The Hon. Mr. Ross extended an invitation to visit Quebec in behalf of the authorities and citizens of that province, and was followed by Alderman Henderson, of Ottawa, who spoke in behalf of its citizens. After a few words by the United States Consul, Col. Richard Lay, John M. Garland, President of the Board of Trade of Ottawa, presented an address from that body.

Prof. T. Egleston, in the absence of the president, Richard Pearce, of Argo, Col., briefly acknowledged the courtesies extended, and called upon Dr. R. W. Raymond, the secretary, to respond. The latter spoke in his happiest vein.

The regular business was then taken up, Professor Smock reading a biographical sketch of the late Dr. George H. Cook, State Geologist of New Jersey. He was followed by Dr. R. W. Raymond, who presented a similar notice of the late W. H. Scranton, of Oxford, N. J. With the aid of a few hastily gathered notes C. A. Ashburner, of Pittsburgh, paid a tribute to the late Capt. Wm. R. Jones, of the Edgar Thomson Works.

Among the 50 new members elected at the close of the session were the following who are well known as connected with the iron and steel trades: David A. Bennett, of Bessemer, Mich.; E. M. Butz, H. P. Butz and Frederick A. Yeager, of the Columbia Iron and Steel Company, Uniontown, Pa.; Ralph A. Jones, of Newberry, Mich.; Wilbur A. Langdon, Allentown, Pa.; William A. Leonard, of West Wareham, Mass.; Samuel D. Mills, St. Ignace, Mich.; Charles McCrery, Troy, N. Y.; Enrique Fouceda, Troy, N. Y.; Frank D. Gurney, Scranton, Pa.

Wednesday.

Wednesday brought an additional number of members, among them N. M. Langdon, of Port Henry; James E. Jopling, of Marquette, Mich.; F. Prince, of Slatington, Pa.; J. S. Lane, of Chicago, and John Birkinbine, of Philadelphia. Among the other prominent members present were J. H. Branwell, who is connected with the famous Flat Top coal and coking interests of Virginia and West Virginia; W. B. Cogswell, of the Solvay Process Company, Syracuse, N. Y.; C. A. DeCamp, of Boonton, N. J.; Jos. C. Platt, of Waterford, N. Y.; A. C. Rand, of the Rand Drill Company, New York; J. C. Smock, of Albany, N. Y.; E. D. Peters, Jr., of Sudbury, Ont., and N. R. Leckie, of Sherbrooke, who is largely interested in the coal and iron developments of Nova Scotia.

The morning was given over to a drive to the famous Chaudiere Falls and the great lumbering establishments to which they give life. A number of the mills and factories were inspected, including a match factory in which some ingenious special machinery was at work. After driving to the Central Experimental Farm the party returned to Ottawa.

Afternoon Session

was opened with a paper by Dr. Robert W. Ells, of Ottawa, who is connected with the Geological Survey of Canada, with a paper on the "Mining Industries of Eastern Quebec," in which he dealt principally with the copper, asbestos and gold mining industry of that section of Canada. The copper, or rather the pyrites, mining is confined to two concerns in the vicinity of Capelton—the Nichols and the Eustis mines. The bulk of the ore is shipped to sulphuric acid concerns in this country, although smelting for matte on the spot was rendered very profitable during the Secrétan boom. A part of the product of the Nichols Mine is used on the spot for the manufacture of acid, a portion of which is consumed in the manufacture locally of superphosphate.

The greater part of the asbestos mining is done in two districts—the Thetford, where four companies are working, and the Black Lake, where an equal number are mining. The latter district produces a fiber which is harsher. The percentage of the different grades of asbestos produced varies widely, the majority of the mines making fiber of from 2 to 3 inches. Firsts range in value from $80 to $100 per ton, seconds from $50 to $75 and thirds from $15 to $40. At the conclusion of the paper, which alluded also to the slate quarries and the gold mines, Robert G. Leckie, of Sherbrooke, Ont., exhibited a bottle full of gold nuggets from a little stream near Tilton, valued at $2600.

C. A. Ashburner, of Pittsburgh, followed with a paper on "Natural Gas Explorations on the Ontario Peninsula," in which he made the broad statement that in his opinion gas would not be found on the Ontario Peninsula or in the St. Lawrence Valley in sufficient quantities to allow of its being piped for a distance of ten miles. In the course of the discussion a member noted as an exception to this sweeping rule a 9,000,000-foot well at Kingsville, which inspired sufficient confidence with one of the staff of the Canadian Geological Survey to resign and take charge of the property.

In the evening a reception was tendered to the visiting engineers at the Russell House, a very large representation of Ottawa's citizens and officials being present.

Thursday.

Thursday morning was given over to visits to the Museum of the Geological Survey of Canada, the Parliamentary Library, the Senate and House of Commons and the Canadian Granite Company's Works.

The afternoon session was taken up by the reading of papers and their discussion, on subjects of comparatively little interest to the readers of *The Iron Age*. They included a contribution by E. Gilpin, Jr., of Halifax, N. S., on the "Geological Relations of the Nova Scotia Minerals;" "Notes on the Port Arthur Silver Deposits," by E. D. Ingall, of Ottawa; "Gold Mining in Nova Scotia," by John E. Hardman, of Oldham, N. S., and "Notes on the Collection of Float Gold," by T. Egleston, of New York.

The evening session opened with a paper on the "Phosphate Deposits of the Ottawa Valley," by Dr. Bell, which was discussed by a number of gentlemen connected with that local industry. This was followed by the most important paper of the meeting, by Dr. E. D. Peters, Jr., of Sudbury, Ont., on

THE COPPER-NICKEL DEPOSITS OF SUDBURY.

Some years since the metal trade was startled by the announcement that mountains of copper ore had been discovered in the vicinity of Sudbury, Ont., and that additional pressure would be exerted on the then greatly depressed copper market. The copper trade has well-nigh forgotten those discouraging predictions, but in another branch of the metal business the predictions of a much increased supply, coupled with greatly lowered prices, have been fulfilled to some degree. It may be broadly stated that for some time to come nickel, the metal alluded to, is bound to show constantly declining values. How cheap nickel will become will depend upon the policy adopted by the owners of the Sudbury mines and works, the Canadian Copper Company, with which such men as Senator Payne, of Cleveland, are identified. From all accounts the Sudbury deposits are very large in extent, rich in nickel, and are characterized by some features which render cheap manufacture under skilled management possible. When the Sudbury mines were first opened the presence of nickel in the ore was not suspected. A shipment was made to the Orford Copper Works, near New York, and was smelted in the usual way. During the final process of refining the

color of the refinery slag attracted attention. It was analyzed and then its nickel contents were revealed. It is stated that the lot of slag from the shipment alluded to realized about $17,000 at the Wharton Works. Dr. Peters divides the deposits at Sudbury into three groups, of which each one of the three mines of the Canadian Copper Company is typical. We may note parenthetically that the company in question control all the deposits of any moment thus far discovered in the district with the exception of one—that recently opened by the Dominion Mineral Company.

The Stobie Mine, four miles north of Sudbury, is typical of that class of deposits which consists of massive nickeliferous pyrrhotite, monosulphide of iron, with occasional pockets of chalcopyrite, or copper pyrites. It occurs in bodies known to be 100 feet thick in some places, although the limits have not yet been ascertained. The ore is extracted by open cast work, large masses being thrown down at one blast. Recently 560 tons were obtained at one blast. Until now the ore has been broken and loaded by hand, but at an early date the arrangement for substituting mechanical appliances will be complete. It is believed that then 80 tons a day can be produced at a cost for mining of between 30 and 35 cents a ton. The ore obtained from this mine is particularly welcome for the sake of its high percentage of iron, which after roasting is an excellent flux for the rocky ores of the other mines.

The Copper Cliff Mine is typical of the second class of deposits. The ore is pyrrhotite and chalcopyrite, but is not so massive as the ore of the Stobie Mine, being much mixed with the diorite. The ore occurs in irregular masses, but is very rich in nickel, large bodies being exposed which carry from 6 to 8 per cent. of nickel. The mine is now down to a depth of 500 feet, the incline having been driven down to that point. The active level, however, is the third. A somewhat peculiar method of mining has been adopted which, it is stated, lowers the cost of extraction by about 30 per cent. as compared with the cost of the methods usually in vogue. Instead of starting a level as usual and stoping upward from it, they sink a winze as near the shaft as it is compatible with the safety of the latter, connecting it with a short drift at the lower level from the shaft. Underhand stoping then progresses from the upper level downward, beginning from the winze, which acts as an ore chute.

The third important mine of the Canadian Copper Company is the Evans, which carries a large body of pyrrhotite which differs from that of the Stobie Mine in being more highly nickeliferous. It produces about 60 tons of first-class ore per day. After being broken and screened the ore is roasted. Special pains have been taken at Sudbury to prepare the roast-yard properly by thorough leveling. It is 100 feet wide and nearly half a mile long, with a broad-gauge track on a trestle commanding it, while a second track sunk 4 feet below its level is used to remove the roasted ore. One special "kink" has been introduced in the pile-roasting, the simplicity and efficiency of which will commend itself to copper-smelters. The sides of and the floor between the adjacent piles are covered with a layer of wood, and then the entire space between them is filled with ore, which is roasted in the usual manner. This aids the complete roasting of the outer layers of the adjacent ore piles, which usually need such aid. At Sudbury each ore pile contains about 800 tons of ore, which requires about 30 cords of wood, so that the fuel cost is about 4 cents per ton, while the total cost is within 20 cents a ton. The piles burn about 60 days, the ore being so well roasted that it contains only about 7 to 8 per cent. of sulphur, and as much as 30 per cent of green, unroasted ore can be used with it in the subsequent smelting operation.

The Canadian Copper Company have two smelting-furnaces, the second having been recently started. These furnaces are steel, water-jacketed, of the Herreschoff type, 3½ x 6 feet 3 inches in section at the tuyeres, the corners being rounded and the sides slightly concave, so that the section approximates the oval. They are blown through 11 2½-inch tuyeres, five at each side and one at one end. They have the usual drop bottom and are 6 feet high from the tuyere line to the charging-door, the 2-inch water-jacket extending to that level. They are provided with dust-chambers and a 60-foot stack. The smelted material flows directly through a water-jacketed neck into a water-jacketed removable well, from which the accumulated matte is frequently tapped.

The roasted ore is charged without any flux whatever, a proper mixture of the three classes of ore rendering it unnecessary. Dr. Peters mixes the ore before roasting and attaches much importance to that system, holding that it contributes largely to smoothness of work in the furnaces. The latter have been achieving an exceptional record, smelting as the average of months of work 125 tons of ore per day, and going as high as 156 tons in one day. The fuel consumption, counting the actual quantity used for months, based on the deliveries paid for, is only 1 ton of coke for 8 tons of smelting mixture—certainly a very low figure. The coke is Connellsville, which costs, delivered, including duty of 60 cents per ton, about $7.25, so that the cost of fuel in smelting is less than $1 per ton. The product is a matte carrying about 27 per cent. of copper and 15 to 18 per cent. of nickel, the quantity made being a little under 40 tons daily. This matte is shipped to the Vivians, in Swansea, Wales, to the associated German smelting-works via Hamburg and to the Wharton Nickel Works, at Camden, N. J., a sale of 500 tons to the latter having been made lately. We discuss editorially the questions arising from this enormous addition to the annual product of nickel. Suffice it to say that while the total production of the world until Sudbury began work was estimated at about 1000 tons annually, the Canadian Copper Company are capable of producing over 2000 tons annually. An increase over that through enlarged facilities is even talked of.

The hour being too far advanced, the remaining papers were read by title.

During the progress of the meeting the visiting members were presented with an exceedingly handsome *souvenir* in the form of an album of photographs of exceptional merit, by Topley, of Ottawa. They include a portrait group of the staff of the Geological and Natural History Survey, photographs of the Houses of Parliament, the canal locks from the Dufferin Bridge, the Chaudiere Falls in summer and in winter, the Rideau Falls, a scene on a lumber raft, a view of a jam of saw-logs, the High Falls above Buckingham, the open cast of a phosphate mine at Lievres, Quebec, a tobogganning scene at the Government House and the Canadian Falls of the Niagara. Not content with the hospitalities and courtesies shown to the institute during their stay at Ottawa, the Canadians had laid out a series of excursions, which unfortunately your correspondent could not participate in. Since none of those returned who joined in the trips, which will take the greater part of the present week, your correspondent can only give a summary of the programme.

Friday and Saturday.

On Friday the party was wakened early by the strains of a brass band, and was carried by train, via the Canadian Pacific Railway, to the village of Buckingham. Taking a special steamer, they proceeded to Little Rapids Landing, where luncheon was served. They returned to Buckingham to participate in an informal reception at the Crystal Rink, and were brought back to Ottawa in the evening.

Saturday the greater number of the visiting engineers and their ladies started on the excursion through the eastern townships. They were to go to Montreal early in in the morning and spend Saturday and Sunday there as the guests of the Canadians. On Monday the excursion was to be resumed, the party going first to Sherbrooke, thence via the Quebec Central Railway to Blake Lake and Thetford, the two principal asbestos mining districts. The quarries of the Dudswell Lime and Marble Company, at Marbleton, were to be visited on Tuesday, and the remainder of the day was to be passed at Sherbrooke, where the Mayor and corporation were to tender a public reception. Leaving Sherbrooke on Wednesday the party was to go to Richmond, where the New Rockland slate quarries are to be inspected. The original programme was to return then to Montreal, but an urgent invitation was received to visit Quebec and spend some time there as the guests of the municipality, an invitation which will probably be accepted.

Another excursion contemplated was to visit the Port Arthur silver mines, on the north shore of Lake Superior, but an insufficient number of members signified their intention to join it, so that that part of the programme was abandoned. Some of the citizens of Port Arthur had also tendered an invitation to two or three of the members to take a day's canoe trip into the interior to examine some iron mines.

A third excursion, which started on Saturday, went to Sudbury to visit the mines and works of the Canadian Copper Company and the property of the Dominion Mineral Company and other mines.

The Louisville fall celebration was successfully begun on Tuesday, 1st inst., by a fine industrial parade. The procession was two hours in passing a given point, and was enlivened by citizen-soldiery, the fire department and brass bands. Some of the floats representing the different trades and industries were very handsome and comprehensive. Most prominent in the procession was the display of B. F. Avery & Sons, who had four large floats, each drawn by four horses, showing to great advantage their different makes of plows. The celebration was continued on Wednesday night by a flambeau parade, the effect being enhanced by arches of colored lights over the intersection of cross streets. Thursday afternoon the city again put on holiday attire and turned out in multitudes to welcome King Mercury, the god of commerce, his queen and courtiers, who arrived by water on a profusely decorated steamer. On Friday night the climax was reached by the procession of the satellites of Mercury, including hundreds of allegorical floats, forming a pageant said to have outdone the *Mardi Gras* of New Orleans. The festivities were completed by a ball. The railroads entering the city were very liberal in both subscriptions and reduced rates, aiding the fall celebration to be the complete success that it was in advertising Louisville's resources and bringing here thousands of visitors.

President A. C. Cheney, of the National Board of Steam Navigation, is apprehensive of disaster as a consequence of running ocean steamers at full speed in a fog, which he says should be condemned.

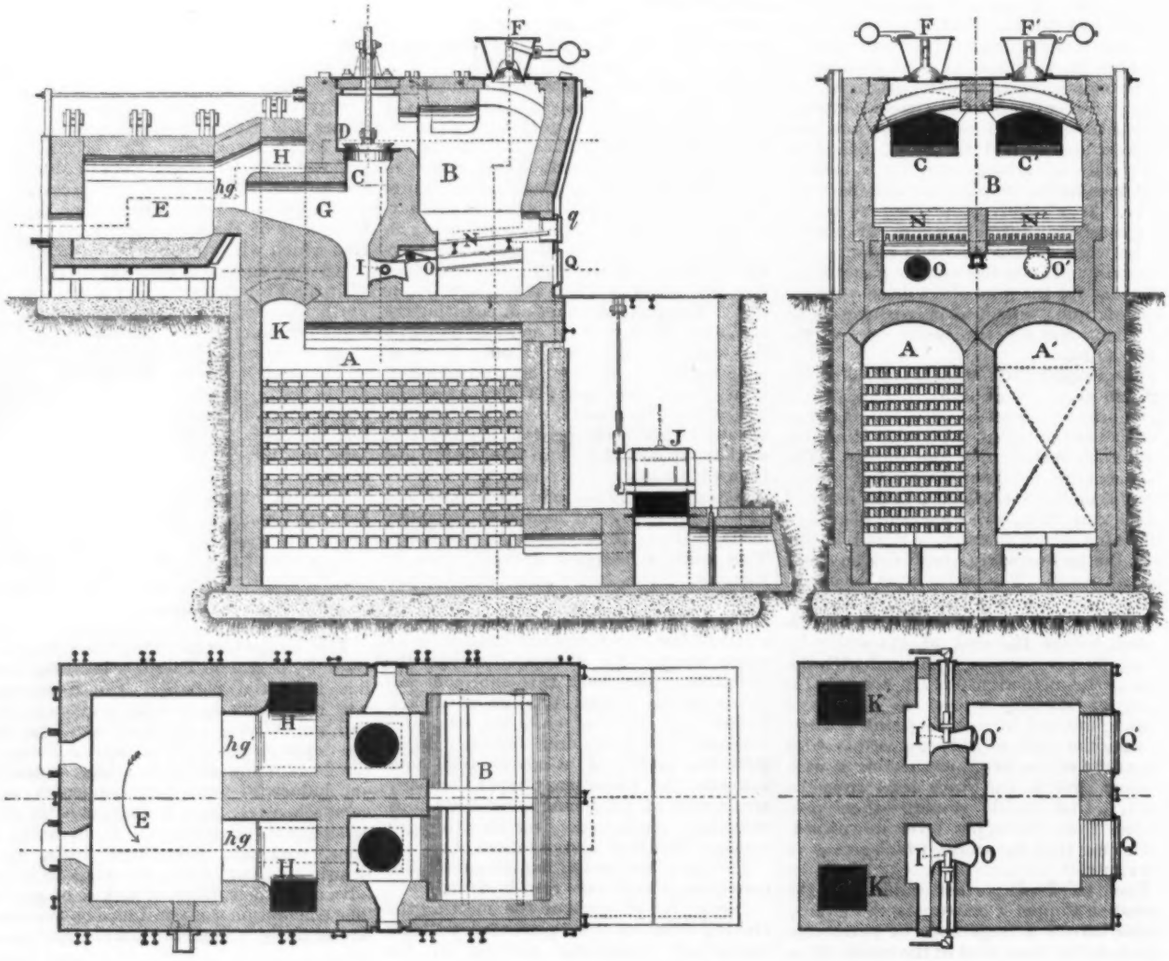
THE NEW SIEMENS FURNACE.

BY JOHN HEAD AND P. POUFF.*

In considering the details of construction it occurred to E. Biedermann and E. W. Harvey, who are on Frederick Siemens' technical staff (the former having entered the service of the late Sir William Siemens about 34 years ago), that possibly further economy in fuel might be realized by a re-arrangement of some of the parts of the regenerative gas furnace. Their attention was directed to the conversion of solid fuel into gas in the producer and to the relatively high temperature at which the products of combustion passed from the furnace into the regenerators, as also to the chemical composition of these products, which temperature and gases they thought might be utilized in the gas-producer.

In an ordinary gas-producer the production of carbonic oxide is effected in two operations; on the grate carbonic acid is formed in the ordinary course of combustion, and this carbonic acid is afterward converted into carbonic oxide by taking up another equivalent of carbon while passing through the incandescent fuel in the upper portion of the producer, and in this condition it flows on to the furnace with the other gases distilled from the coal during the process of gasification. It should be remembered, however, that the production of carbonic acid on the grate of the ordinary gas producer is attended with the development of heat; whereas the conversion of carbonic acid into carbonic oxide in the upper portion is carried on at the expense of heat. In the new Siemens furnace the gaseous products of combustion from the heating-chamber of the furnace are delivered under the grate of the producer, these gases consisting of intensely-hot carbonic acid, water in the gaseous state and nitrogen. The production of carbonic acid in the producer may be dispensed with, but in this case the heat attending the production of carbonic acid in the producer has also to be dispensed with. It had therefore to be ascertained whether the products of combustion from the heating-chamber would contain a sufficient amount of heat for insuring their conversion into combustible gases. This has been found to be the case in practice with furnaces working regularly for the past six months—a satisfactory result that is probably due to the presence of a large quantity of heated nitrogen in the products of combustion, which, passing through the producer without undergoing chemical alteration, maintains the heat of the fuel. Assuming that the producer contains only coke in the incandescent state, this coke if fed with oxygen will produce carbonic acid in the lower zone, which will be converted into carbonic oxide in the upper zone; but if fed with hot carbonic acid, instead of oxygen, one-half the fuel, comprising the lower zone, may be dispensed with, and an economy in weight of fuel to the same extent will be realized.

The furnace about to be described must be clearly distinguished from that class of regenerative gas-furnace first suggested by R. Laming in 1847, where conduction air-regenerators alone are employed. The latter form of furnace is necessarily wasteful in working, inasmuch as in theory it can only utilize about one-half of the total heat contained in the gases leaving the furnace chamber, this being the ratio of the air for combustion to the amount of gases made from coal entering the furnace, and in practice it would fall short of this saving, owing to the class of regenator employed, in which the heat from one current to another had to be transmitted through brick-work. In the new Siemens furnace, on the contrary, the waste gases are directed partly through an air-regenerator and partly under the grate of the producer, there to be reconverted into combustion gases and to do the work of distilling hydrocarbons from the coal; in fact, the gas-producer in this case absorbs or utilizes the heat formerly deposited in the gas-regenerators of furnaces; and in doing this transforms spent gases into combustible gases. It is held as an axiom, and the construction of the new furnace is based upon this consideration, that, besides air-regenerators, gas-regenerators or their equivalent in the form of a converter-producer must be provided for absorbing all the heat contained in the gases leaving the furnace-chamber. In the converter the fuel absorbs the waste heat from a portion of the products of combustion leaving the furnace, and at the same time carbonic acid and water-vapor are converted into carbonic oxide and hydrogen. Disregarding the small proportion of water-vapor



THE NEW SIEMENS REGENERATIVE FURNACE.

* From a paper read at the Paris meeting of the Iron and Steel Institute.

they contain, the products of combustion from a furnace may be taken as consisting of CO_2, 17 per cent.; O, 2 per cent.; N, 81 per cent.

The 17 per cent. of CO_2, also the 2 per cent. of O, are converted into CO, while the nitrogen simply passes through the fuel without change, and serves the useful purpose of maintaining its heat for the conversion of the other gases. For the propulsion of the gases through the converter a steam-blast is employed. This steam is superheated by the waste gases from the furnace, and, mixing with them, forms a very hot blast indeed under the grate. This furnace may be constructed in various forms, the one shown in the accompanying diagrams (Figs. 1 to 4) having been used with success for heating and welding iron. It is a radiation furnace, heated by means of a horseshoe flame. This form of flame offers advantages in this as in ordinary regenerative gas-furnaces, but its adoption is not obligatory, as the flame may be made to traverse the heating-chamber from end to end in the usual manner. The same letters indicate the same parts in all the figures. A A′ are reversible regenerators for air, on the top of which is built the gas producer or converter B, of which F F′ are the charging hoppers and N N′ the grates The heating-chamber E adjoins the producer, resting on the ground, or in some cases a pit may be provided below it. C C′ are the flues leading the combustible gas to the furnace-chamber E, the passage of the gas in these flues being controlled by the valves D D′ at the two ends of a rocking-beam, so that the outlets are opened and shut alternately to convey the gas to one or other of the ports G G′ of the heating-chamber E. H H′ are the air-ports of the heating-chamber, communicating through the flues K K′ with the regenerators A A′. I I′ are steam-jets placed in the return flues for directing a portion of the waste products of combustion to the grates of the converter. J is the valve for reversing the direction of the air flowing into the furnace and of the products of combustion through the regenerators to the chimney flue. O O′ are hinged caps for alternately admitting and shutting off the products of combustion from the heating-chamber to the converter. These caps are worked automatically by means of connections attached to the rocking-beam, the same movement which closes D opening O′, and that which closes D′ opening O. Q *q* are doors for giving access to the grates of the converter for clearing them.

The *modus operandi* of the furnace is as follows: Gas from the converter B passes through the flue C′ and the valve D′ to the gas-port G′, and into the combustion-chamber *h′ g′*. Air for combustion passes through the regenerator A′, the air-flue K′ and the air-port H′ into the combustion-chamber, where it meets the gas from the converter, and combustion ensues. The horseshoe flame sweeps round the heating-chamber E, the products of combustion passing away by the second combustion-chamber *h g* and going partly through the regenerator A and reversing valve J into the chimney-flue and partly down the flue G, whence they are drawn by means of the steam jet I through the capped inlet under the grates N N′ of the producer B, there to be converted into combustible gases. From time to time the direction of the flame in the furnace is reversed by manipulating the rocking beam, carrying the valves D D′ and the reversing valve J in the usual manner of working regenerative gas-furnaces. An auxiliary steam-jet is provided for the purpose of supplying atmospheric air to start the producer when the furnace is first heated up.

The new form of regenerative gas-furnace has been applied in this country to the heating and welding of iron, to which uses its application is being extended in England and abroad, while furnaces are in course of construction to apply it for puddling iron and for copper and steel melting. Altogether ten furnaces for these purposes are in course of construction, in addition to two furnaces already at work for heating iron. The first furnace of this kind was constructed at the Pather Iron and Steel Company's Works, at Wishaw, for welding iron, and much credit is due to the proprietors for having had the enterprise and public spirit to make the first application of this improved regenerative gas-furnace. The working has been eminently satisfactory from the commencement. The success of this first application of the furnace proves the correctness of the principle upon which it is constructed and the means adopted for carrying it out. The results of working during the past six months have shown an average saving of 5 per cent. in waste on the weight of the iron heated and a saving of upward of two-thirds of the weight of coal used and a greater money saving owing to the inferior quality of the fuel employed as compared with that used in their other furnaces fired with solid fuel. From the total saving thus realized should, however, be deducted the cost of raising steam, for which purpose the waste heat of the old furnaces is utilized. Allowing for separate boilers, the saving effected by the use of the new system in a furnace heating 8 tons of iron per shift is nearly 18 tons of coal per week, and the money saving in iron and coal exceeds £1000 per annum.

This new furnace has also been recently applied for heating billets by the United Horse Shoe Company, of London, and in this case the results are quite as satisfactory or even better than those just given, as is shown by the table given above.

It will be noticed from these results that in this furnace 12 charges were made in less than 12 hours (11 hours 40 minutes), each weighing about 16 hundredweight and yielding in the finished state as horseshoe iron 15 hundred-weight per charge, or 9 tons in the day. The amount of small coal used was rather less than 24 hundred-weight. This is equivalent to $\frac{24}{9}$ = 2⅔ hundred-weight per ton of finished rolled iron, which, it will be admitted, is a most satisfactory result. Later on the consumption of coal was reduced to 2 hundred-weight per ton, each billet coming out at a full welding heat and rolling into a sound bar. The coal used was screenings, which can be obtained at the lowest price.

Date.	Number of charges.	Time.	Average time required for heating to welding.	Weight of rolled billets, 2¼ inches square.	Coal.		
					Weight of coal used.	Coal used per ton of billets.	Quality.
1889.			Minutes.	Tons. Cwt.	Cwt.	Cwt.	
Friday, Sept. 13...	11	5.45 a.m. to 5.25 p.m.	21	8 16	17½	1.9	Newcastle small.
Saturday, Sept. 14	6	5.30 a.m. to 11.45 p.m.	20	4 16	8	1.7	Newcastle cobbles.
Monday, Sept. 16..	11	5.45 a.m. to 5.30 p.m.	21	8 16	17¾	2.01	5-6 Newcastle small, 1-6 London screenings
Tuesday, Sept. 17.	11	5.45 a.m. to 5.30 p.m.	20	8 16	18¼	2.08	London screenings mixed.

The following are the analyses of gas made in the converters at Pather and in London respectively:

Pather Company, from Wishaw Coal (Nuts).		*United Horse-Shoe Company, Newcastle Cobbles.*	
CO_2	4.6	CO_2	4.5
O	*nil*	O	*nil*
CO	23.0	CO	22.5
H total	17.4	H	16.3
C vapor	1.5	CH_4	2.6
N	53.5	N	54.1
Total	100.0	Total	100.0

From these analyses it will be seen that the proportion of CO_2 in the gas made in the converters is not greater than that made in the ordinary Siemens producer. Besides the advantages in the saving of fuel and metal, it is desirable to call attention to the simplicity of design of the new furnace, owning to which its cost of construction is not much greater than that of a solid-fuel furnace, while its cost of maintenance is very much less. The cost of construction of the new furnace is found to be about two-fifths of that of the old form of regenerative gas-furnace of the same productive capacity, with separate gas-producers and gas-regenerators, and the space occupied below ground is also considerably reduced. A saving of labor attends the employment of the new furnace, as owing to the producer being connected with the furnace the same men can attend to both, and the labor of firing is reduced in proportion to the reduced consumption of fuel.

In conclusion, the following advantages may be claimed for the new furnaces as compared with solid-fuel furnaces used for heating and welding iron, viz.: A saving in fuel amounting to, say, two-thirds in weight, after allowing for raising steam in separate boilers, this saving being fully equal to 5 hundred-weight of coal per ton of iron heated. A reduction in the waste of iron equal to 5 per cent. upon the weight of metal heated. A saving in labor and repairs which will probably compensate for the extra cost of the new furnace. Taking a furnace to heat 10 tons of iron per shift, or 110 tons per week, the following calculation gives the money saving realized by the adoption of the new furnace:

110 tons iron at 5 hundred-weight per ton = 27½ coal saved at 6/	£8. 5/
110 tons at 5 per cent. = 5½ tons iron at £4	22.
Being	£30. 5/

per week, or, say, £1500 per annum.

It may be added that the authors had hoped that the application of this furnace to the attainment of high temperatures, such as are required for steel melting, might have been included in the paper, but the furnaces building for this purpose are not yet completed. Should they, however, be working when the paper is read information with regard to them will be given in the discussion.

For steel plates for the battle ship Texas there were but two bids opened at the Navy Department last week. The lowest was from the Linden Steel Company, who bid $43,532 for 256 tons of protective-deck plates, and $73,438 for 415 tons of similar plate for middle layers and redoubts. The other bidder was Carnegie, Phipps & Co.

Pumps for Boiler-Feeding.

Our illustrations this month, says the *Locomotive*, to whose courtesy we are indebted for the accompanying engravings, show two arrangements of pumps that were designed for boiler-feeding by this company, and have now been in successful operation for a considerable time by the Boston Duck Company, Bondsville, Mass., and the Otis Company, Ware, Mass., respectively. The particular difficulties that the systems were designed to overcome were as follows: In each case a large amount of water is used, and in order to run economically it was desired to return the drip from the various mills to the boiler-room. This was attended with considerable dfficulty, as the boilers are higher than the points where the traps must be placed. A survey of the yards showed that certain points could be selected, though at considerable distances from the boiler-houses, to which the drips could easily be returned; and it was resolved to place the receiving-tanks at these points. In order that the pumps might be flooded it was necessary to place them in the same pits with the tank, several hundred feet from the boilers; and after some consideration it was decided to do this, and to arrange the pumps so that they might govern themselves automatically and not need the personal attention of the firemen.

Fig. 1 shows how this was accomplished at Bondsville. Into the tank A all the drips from the mills are discharged by means of traps of our own design. The exhaust from the pump also discharges into the same tank. The water in tank A is maintained at a constant level by means of a governor, J, which controls a valve, H, in the feed-pipe G in the usual way. This governor communicates with the tank by means of the pipes shown, which are provided with cocks, L and K, so that the governor may be shut off from the tank when desired. Within the tank the feed-pipe is perforated, as shown at V, so that the incoming water may condense any steam it may come in contact with and be itself heated thereby. A blow-off is provided at N and a 3-inch overflow-pipe at P, which discharges surplus water into the blow-off through R and allows any uncondensed steam to escape through Q.

The pump B draws its supply from the tank through pipe D and discharges through pipe M, which passes to the boiler-room. Steam to operate the pump enters through the pipe C, which is provided with a reducing-valve as shown, which serves to maintain the pressure on the steam end of the pump constantly at 35 pounds, which is indicated by the gauge E. The water-pressure in pipe M is indicated at F.

The operation of this system is very simple. If the attendant in the boiler-room shuts off all his valves, the pressure in the water-pipe M immediately runs up to from 100 to 105 pounds, the steam and water cylinders of the pump being so proportioned that when this pressure is attained the water in M just balances the reduced steam-pressure in C, and the pump can no longer run. It therefore remains motionless until a valve is opened somewhere on the pipe M. Then, the pressure in M being relieved, the pump is no longer balanced; the steam pressure preponderates and the pump starts. This adjustment is so fine that if the attendant opens his valve a single spoke the pump responds immediately and moves so slowly that its motion can hardly be seen; while if he opens all his valves wide the pump instantly starts at full speed.

To prevent unpleasant rattling and pounding in the boiler-room a stand-pipe, S, is provided near the boilers, which acts as an air-chamber and causes the whole to work smoothly and noiselessly. It happens occasionally, as for instance when the temperature of the boiler-feed is changed, that some of the air in S is absorbed or dissolved by the water, so that in time (say once in two or three months) pipe S becomes filled with water and ceases to act as an air-chamber. In this case it is only necessary to stop the pump for a few moments and open the small cocks T and U. Water then runs out at U and air bubbles up through T into the chamber overhead. When sufficient air has entered the small cocks are closed and the system is ready for operation once more.

The plant at the Otis Company's mills is similar in principle, but somewhat more complicated in its details owing to the fact that a power-pump is there used in addition to a steam-pump. The operation of this plant will be understood from Figs. 2 and 3, which are respectively an elevation and plan of the whole system. In these figures A is the tank for receiving the drips, X is the governor and U the valve that regulates the flow of water from the river into the tank through the perforated pipe V. The power-pump B has two fly-wheels, C and D, one of which runs the driving-belt. It draws water from the tank through pipe E and delivers through G K L to the boilers. The steam-pump P is provided with a reducing-valve, Q, as in the plants previously described; it draws its water from the tank through M and delivers it to the boilers through R R^1 L. At T a pipe is shown which runs through the mills and supplies water in case of fire or other emergencies. Valves are provided at S and N that allow the steam-pump to be shut off entirely if desired, and similar valves, H and F, are provided for the power-pump.

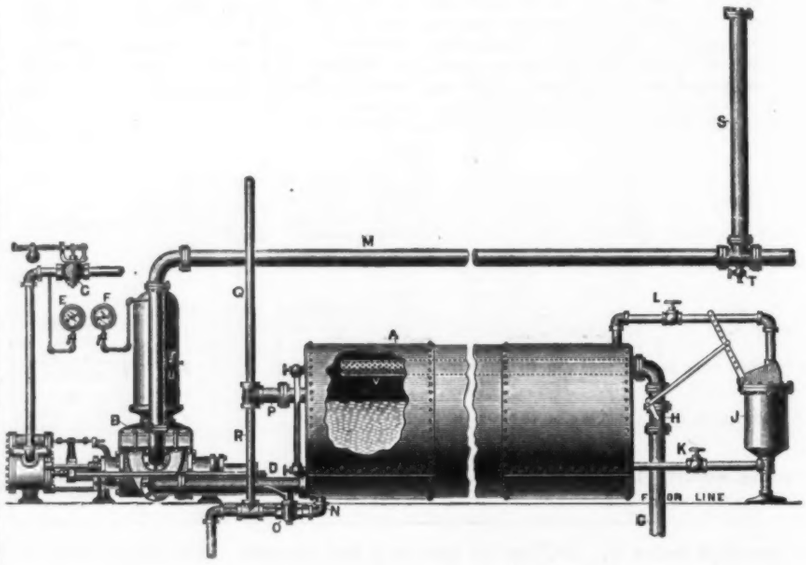


Fig. 1.—Arrangement of Pumps for Boiler-Feeding, in Use at the Boston Duck Company's Works, Bondsville, Mass.

The action of these combined pumps is as follows: The power-pump B runs continuously while the machinery is in motion, and it is ample in size to supply all the ordinary wants of the boilers. In case the demand for water is less than the supply that this pump affords (which is frequently the case), the surplus passes back to the tank A through a relief-valve, J, which is set to open at 115 pounds water-pressure. Under these circumstances the steam-pump P remains motionless; for the steam-pressure in it is kept constantly at from 24 to 25 pounds by means of Q, which corresponds to a pressure in the water end of 105 pounds, so that it is impossible for this pump to start unless the pressure in K L falls to 105 pounds or less—that is, it is impossible for it to start while the demand for water does not exceed the capacity of the power-pump.

To follow the action of the pumps, let us first suppose that all the valves in the boiler-room are closed. Then the pressure in the main K L rises at once. As soon as it reaches 115 pounds the relief-valve J opens, and after that the entire delivery of the power-pump passes up through J and W and back into the tank A. Now, let us suppose that the belt on the power-pump breaks. Immediately the delivery of this pump ceases and the valve J closes. The pressure in the main K L is now 115 pounds, and both pumps are motionless. Now, suppose an attendant in the boiler-room opens a feed-valve there, the pressure in the boiler being only 80 pounds, water begins to flow from the main into the boiler; but this reduces the pressure in the main K L, which pressure, at the time of opening the valve into the boiler-room, was 115 pounds. The moment that this pressure falls below 105 pounds, however, the steam-pump P ceases to be balanced, the steam-pressure preponderates over the water-pressure and the pump starts with a velocity proportional to the demand for water, the working of this pump from this moment on being exactly the same as the working of the pump shown in Fig. 1.

Now let us look back to the beginning once more, and suppose that the belt on the power pump does not break, but that the demand for water, owing to a fire breaking out or to any other cause, suddenly increases, so that pump B can no longer supply it. The pressure in K L then decreases as before, the relief-valve J closes, the steam-pump P starts up the moment the pressure in K L falls to 105 pounds, and both pumps run together, the power-pump at a uniform speed and the steam-pump at a variable speed, depending on the amount of water that is wanted. When night comes on the power-pump, of course, stops at 6 o'clock and the steam-pump at once starts automatically and takes its place, and at 7 o'clock in the morning the power-pump starts once more and the steam-pump stops. In both of these plants pressure-gauges are attached to the steam and water pipes, so that an occasional visit to the pump-room shows at once whether everything is working properly or not. Both systems also have an air-chamber in the boiler-room, as shown at S in Fig. 1, and it seems proper

to say that in each case the pumps have worked smoothly from the ouset and to the entire satisfaction of every one.

In order that the advantage in economy that comes from returning the drips from the various pipes may be appreciated, we would call attention to the following figures: The water in the tanks of these systems has a temperature of between 160° and 190° F. Now, one of the companies referred to in the beginning of this article uses five boilers constantly, and for these boilers and the dye-houses between 15,000 and 20,000 pounds of water are required per hour. To raise this amount of water from, say, 70° to 170°, as many heat units must be expended as would evaporate, say, 2000 pounds of water per hour; that is to say, it would be necessary for this company to run six boilers instead of five if the drips were thrown away.

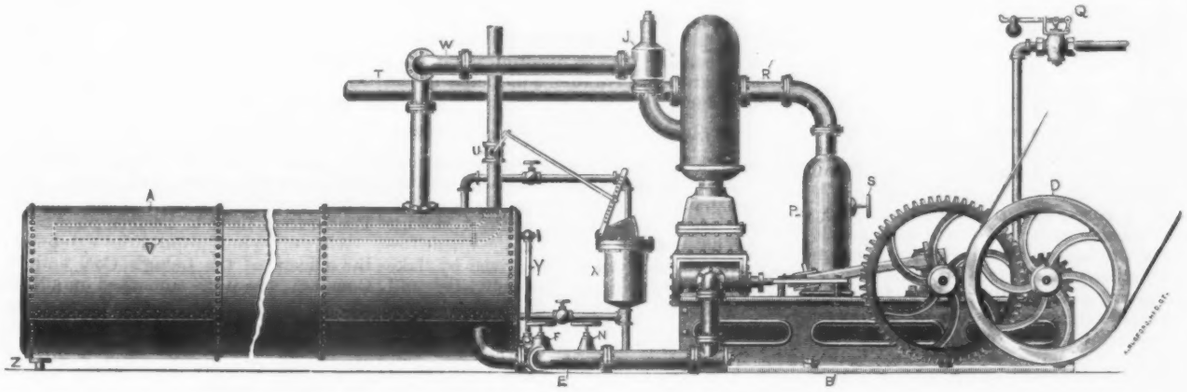


Fig. 2.

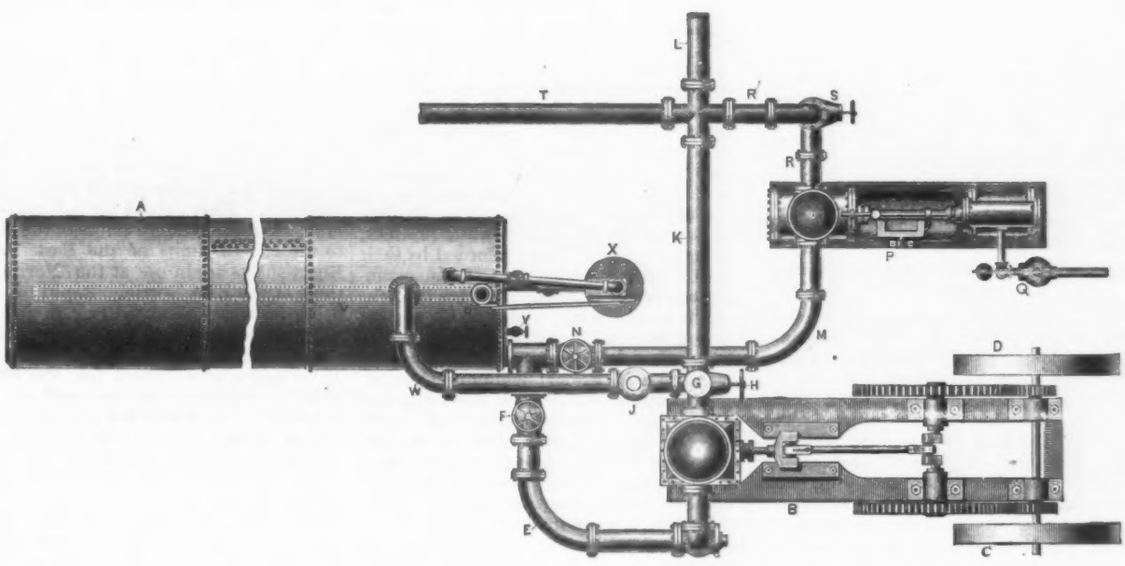


Fig. 3.—Pumps for Boiler-Feeding.—Plant at the Otis Company's Mills, Ware, Mass.

Electric Welding.

The Thomson Electric Welding Company, of Boston, now have, according to the *Commercial Bulletin* of that city, over 80 electric welding-machines in use or in process of construction. The present factory at Lynn is 300 x 85 feet in the main building and 40 x 80 feet in the wing. In this factory about 175 hands are employed. At the factory machines are being turned out and experiments on new work are continually being made. At present electric welding-machines in different parts of the country are being used in the following capacities: Axle-welding, carriage-gears, fifth wheels, twisted wire cables, welding safe ends of boilers, wagon-tires, hoops for barrels; it is also used for joining wires of copper, iron, steel and German silver together in like metals and different combinations. Bars of metals may be joined at angles, as T or Y joints; welding eye rings to the end of bars; making rings of precious metals, uniting steel with iron in the manufacture of agricultural implements, tools, &c.; lengthening or shortening rods, bars, screws or bolts; welding of cast-iron pieces in the general construction of machinery, such as frames, fittings, &c. These machines are also used in welding boiler-plates and other sheet-metal and thereby replace the ordinary method of riveting. The machines are suitable for clamping devices, for electric soldering, brazing, forging or bending of metals.

At present at the factory the electricians of the company are experimenting on radiator and general brazing on riveting-machines, which it is claimed will cause a complete revolution in the old methods of riveting, as by electricity the riveting can be done so as to avoid all leaking. One of the latest and most satisfactory developments has been that of welding chain. The company claim that a great merit to the electrically-welded chain-links is that when subjected to a fracturing load the limb will break away from the weld, whereas when welded by ordinary processes it almost invariably breaks at the weld. Not only is greater efficiency obtained, but the cost of welding by the electrical process is said to be less than 50 per cent. of the cost by other processes. One of the principal machines which is being experimented on is one that will make a chain automatically—that is, by putting crude iron in the machine and have it turn out an iron chain. The company have patented an alternating current dynamo, which is used with the welding-machine, which is adapted to generating currents of enormous volume, but extremely low motive force, which is the quality of current needed. The welding-machines have a potential of ¼ volt and ampèrage of from 600 to 100,000 ampères, according to the size of machine and work made for. The transformer or welding machine consists of an iron core, composed of round disks of sheet-metal, all bolted firmly together. Through the center of the disk is placed a heavy copper tube, which forms the secondary machine. Coils of copper wire are then wound through the tubular secondary and around the iron core. The currents are carried from the secondary to the clamping devices by means of heavy copper conductors, which are bolted firmly to the terminals of the tube. The company let their machines to different concerns, who pay royalties—so much per weld.

The Charcoal Iron-Workers.

TENTH ANNUAL MEETING.

(*Concluded.*)

Tuesday's Proceedings.

Tuesday morning was devoted to sight-seeing in and about the city of Duluth. Quite a number of the members were favored with invitations from citizens to join them in carriage-drives, and as the day was pleasant an excellent opportunity was thus afforded to enjoy the great natural beauty of the locality. The business center of Duluth is strangely located in the least inviting part of the amphitheater of hills overlooking the west end of Lake Superior. The streets ascend with a very decided slope almost from the water's edge, which becomes quite steep four or five blocks back. To make the location still more forbidding, great ledges of very hard stone are encountered which have to be blasted away in opening streets, making sidewalks, laying water-pipe, constructing sewers, &c. The indomitable enterprise which the people of Duluth have shown in erecting a handsome city, with fine business blocks, showy office buildings and superbly paved streets in the face of natural difficulties of a most formidable character is worthy of all praise. Yet both to the east and the west extend long stretches of comparatively level ground, which a visitor supposes would have been first occupied. A boulevard has been laid out near the top of the hills overlooking Duluth, which will form a magnificent driveway, as it lies 500 feet above the lake and is intended to be 16 miles in length.

Immediately after the midday meal the party were taken by W. F. Mattes, superintendent of the West Superior Iron and Steel Company, to West Superior, Wis., which lies on the lake on the opposite side of the St. Louis River from Duluth. Messrs. Lewis, of the Lehigh Coal and Iron Company, and F. C. Roney, a civil engineer, together with other citizens of West Superior, were at the works of

THE WEST SUPERIOR IRON AND STEEL COMPANY

to greet the visitors when they arrived. The company's plant at present consists of a large foundry building, with auxiliary structures, such as boiler-house, &c., to which it is designed to add a blast-furnace in the near future. The foundry building is a very substantial structure of large proportions, being 72 feet wide by 360 feet long, with heavy brick walls and the roof supported by iron trusses designed to withstand the strain of radial cranes. The side walls are buttressed to support a traveling-crane if that should ever be needed. A double window deck runs along the apex of the roof, and a row of windows also runs completely round the sides and ends of the building, affording ample light and means of ventilation. The doors slide on hangers. This foundry is now being fitted up for the manufacture of cast-iron pipe. Two pits have already been constructed and there is room for two more if it is decided to add them. The pits now built are constructed of red brick and are arranged with drying-ovens in the center, ramming-pits at one end and casting-pits at the other. Two cranes are to be placed side by side to serve the ramming-pits, while one crane will serve the casting-pit. Seven radial cranes have been ordered from the Dickson Mfg. Company, of Scranton, Pa., and are now being built. Two cupolas are provided for at the side of the building, but only one of them is in place. It is a Colliau cupola with a capacity of 10 tons an hour. A hydraulic lift will be used to hoist the stock to the charging-platform. A machine-shop, located by the side of and connected with the foundry, is equipped with large lathes, planers and drills and is already in operation. The foundry will not be started on pipes until January or February, but it will be used for special work earlier. General castings will be made in part of the foundry until the growth of the pipe business requires all the room. During the winter it is proposed to prepare the columns, mantels and other castings for a blast-furnace, the erection of which is proposed to be undertaken next spring. The foundations for the stack have already been prepared, and the size of the furnace will be 18 x 80 feet. The members of the company have in view the gradual expansion of the plant into works for the manufacture of steel as well as pig-iron.

The visitors were then conducted to the coke plant of

THE LEHIGH COAL AND IRON COMPANY.

This is a Western corporation exclusively, the name having been adopted because they handle Lehigh anthracite. They have large coal docks with a storage capacity of 400,000 tons. Large quantities of bituminous coal are received by lake from the Pittsburgh, Connellsville and Reynoldsville districts of Pennsylvania, for distribution by rail to points in the Northwest. The fine coal or slack is utilized in the manufacture of coke in a plant of 50 ovens, erected not far from the docks. The ovens are of the usual beehive type with a charging track overhead, and the cars are drawn back and forth from the slack piles at the docks by wire cables. They make 48 and 72 hour coke, and ship the choicest to the smelters of Montana. The remainder is sold to local foundries and for domestic consumption, a crusher being used in preparing domestic coke. These ovens have proved very successful, and the results obtained by their use are so satisfactory that they are believed to have solved the fuel problem in the manufacture of coke pig-iron at the west end of Lake Superior. Although they are now merely utilizing a waste product, the opportunity has been afforded by their erection and operation to test the manufacture of coke at a long distance from the coal mines. With coking coal costing the purchaser 60 cents or 70 cents per ton at the mines in Pennsylvania, coke can be produced at a reasonable figure for metallurgical operations at either West Superior or Duluth. As compared with the alternative of shipping coke, there are several advantages in shipping coal and coking it at the place of consumption. Coal is the cheapest freight carried on the lakes, while coke is undesirable by reason of its bulk and the difficulty of handling it, and would therefore be among the dearest freights. Coke also loses heavily by breakage in frequent handlings. Even if transportation charges are paid on the 1.6 tons of coal required to make a ton of coke, the excess is more than counterbalanced by the peculiarities observed in the handling of coke. One of the new cigar-shaped boats was being discharged of a cargo of coal while the visitors were at these docks, and it was observed that the unobstructed space in the vessel enabled the power scoops to unload it with remarkable rapidity.

In this vicinity the attention of the party was called to the vast scheme of

TERMINAL FACILITIES AT WEST SUPERIOR

now partly completed by the Minnesota Eastern Railroad, which is a part of the Manitoba system of roads. Elevators for grain have been completed, alongside which the largest lake vessels can lie to receive cargoes. On some of the docks, which are 3000 feet long, large warehouses have been built to store freight in process of trans-shipment from vessel to cars or *vice versa*. A coal dock is being built and will be completed next year which will hold 1,000,000 tons of coal. It will be equipped with Brown's hoisters and conveyers and will be among the finest in the country. The Standard Oil Company are constructing a depot here to supply oil to the Northwest and all the way to the Pacific Coast. Tank vessels will bring oil from the lower lake ports and discharge it into large tanks on the dock. A plant will be erected near by to make all the barrels required for railroad shipment. To serve these and other docks the Minnesota Eastern are constructing one of the most extensive railroad-yards in the world. It will be two and one-quarter miles from the beginning of the yard to the end of the docks, and at one place it will be 56 tracks in width. Cars will run down by gravity from the yard to the docks. Six large steel vessels, now running on the lakes, are owned by the same corporation, who are throwing all their business to the head of the lakes instead of Chicago, using the Duluth, South Shore and Atlantic to the "Soo" in the winter and the Canadian Pacific from there to Eastern points.

After enjoying hospitalities extended by the officers of the Lehigh Coal and Iron Company, the party embarked on a Northern Pacific train for Ashland, where supper was served, after which they proceeded by way of the Milwaukee, Lake Shore and Western to Hurley, Wis., in the Gogebic region.

Wednesday's Proceedings.

THE GOGEBIC RANGE.

Courtesies were extended by the Ashland Mining Company, but as arrangements had been made to visit the Norrie Mine which could not be set aside, an early start was made for that giant among iron-ore mines, located near Ironwood, across the Montreal River, in Michigan. Capt. Solomon Curry, A. E. Norrie, Captain Day and others met the visitors and conducted them over the property, which is operated by under-ground workings exclusively. They extend three-fourths of a mile, from the western limits of the Norrie to the eastern limits of the East Norrie. Eight shafts are in use at the Norrie and three at the East Norrie. Rapid work is being done at these shafts. In one day recently, at No. 5 shaft, 875 skips of ore were hoisted, each skip holding over a ton. These mines have turned the 500,000-ton point in shipments this year and are now expected to reach 600,000 tons before the season closes. From 1050 to 1100 men are employed, and operations are being conducted with a view to increasing the output of ore next year. It is confidently stated by some of the owners that the output could be increased 50 per cent. next year if the conditions of the market are favorable. The ore in this district is found in lenses, so that the width of the deposit will vary from a few feet to 275 feet in thickness, but it continues with remarkable persistence in nearly a straight line for many miles. Wherever the very wide bodies of ore have been worked out the ground has caved in, forming large sink-holes. The Norrie ore is mainly of Bessemer quality, although in some parts of the deposit the phosphorus will run up to 0.055 per cent., and such ore is sold separately as a non-Bessemer ore. The average contents are about 64 per cent. of iron, 0.048 of phosphorus and 3 to 3.5 of silica. The fee of the Norrie Mine is owned by J. M. Longyear, of Marquette, and Theodore L. Ayer, of Lowell, but the deposit of iron ore was discovered by A. L. Norrie, son of Gordon Norrie, of New York, who secured a lease of the property and afterward transferred it on royalty to the Metropolitan Land and Iron Company, in whose control it has since re-

mained. It is one of the most profitable of the Lake Superior mines, and the owners will probably clear $1 per ton on all the ore shipped this season, as against 65 cents last year. The transportation of this ore to the shipping docks at Ashland returns good profits to the railroad companies also. The haul is but 40 miles, all down grade to the lake, 30 cars of 20 tons each constitute a train, four men embrace the entire train crew, and the tariff is 70 cents per ton. The Pabst Mine, in the vicinity of the Norrie, is operated by the same owners, who purchased it from Milwaukee parties a short time since, but it is run as a distinct mine. The ore is similar to Norrie ore. About 100,000 tons of it will be shipped this year.

The great opening of the Aurora Mine, in the immediate vicinity, was then visited. This mine is now being worked underground, but its early operations were wholly by open pit, and an enormous excavation was made, probably 500 feet long, 200 feet wide and 200 feet deep. This mine has shipped 160,000 tons of ore this season up to the present time and will get out 200,000 tons before navigation closes.

From Ironwood a short run was made to Bessemer, near which the Colby Mine is situated. The party here examined with much interest the original opening, from which ore was for a time taken out with a steam-shovel at a cost of but 14 cents a ton. Mather, Morse & Co., of Cleveland, were then lessees of the property and retained control of it for three years, their tenure expiring last year. It is now operated by the Colby syndicate themselves. The miners are now working underground. The first stock-pile of any significance during the trip was seen at this mine. The owners had refused to sell at prevailing prices, believing that a better rate would be obtained by waiting. But the stock-pile is now being moved, although it is too late in the season for this mine to figure among the large shippers. The Colby ore contains about 4 per cent. of manganese and was at one time in great demand on that account, consumers believing the presence of the manganese desirable. While the estimate of the value of the ore has undergone a change, its high quality in other respects retains for it an excellent standing in the ore market.

Rain and lack of time together interfered with visits to other mines on the Gogebic range. It was ascertained, however, that but one new mine had begun shipments this year—the Tanner's Fork, at the extreme west end of the range. It will ship probably 25,000 tons. The whole range has forwarded to market thus far this season about 1,500,000 tons, and will wind up the year very close to 2,000,000 tons.

For a part of this trip the visitors enjoyed the company of Messrs. Hurley and Silverthorne, of Wausau, Wis., owners of the fee of a number of the mines on the Wisconsin end of the range. The town of Hurley took its name from Mr. Hurley.

THE CHAPIN MINE, MENOMINEE RANGE.

The party dined at Watersmeet and were then transferred to the Chicago and Northwestern Railroad, on which they continued their journey to Iron Mountain, the seat of operations of the famous Chapin Mining Company. Between showers a very satisfactory inspection of the company's mining plant was made. Dr. N. P. Hulse, formerly connected with the company and therefore, thoroughly familiar with their plant, acted as guide, the present superintendent being confined to his house by sickness. Dr. Hulse was assisted by several of the engineers in the service of the company. An explanation was first made to the visitors that the main power used to operate the hoisting and pumping machinery at this mine was compressed air, which is conducted by a 24-inch wrought-iron pipe from a hydraulic plant located at Quinnesec Falls, on the Menominee River, three miles distant. In compressing the air four Victor turbine wheels are employed, one of which is 1000 horse-power and the whole number aggregate 2600 horse-power. The temperature of the confined air is advanced to 320° by the compression, but when expansion takes place in the cylinders of the engines the temperature drops to 40° below zero, causing the cylinders and exhaust-pipes to be coated with hoar-frost at all times by the condensation on their surfaces of the vapor in the surrounding atmosphere. Two plants of hoisting-engines are used in operating four shafts. In each plant there are two Reynolds-Corliss engines, built by Edward P. Allis & Co., of Milwaukee, while the drums and other hoisting-gear were furnished by the M. C. Bullock Mfg. Company, of Chicago. These engines each have 30-inch cylinders and a 5-foot stroke. It takes but 18 seconds to hoist a load from the bottom of the principal shaft, which is 375 feet deep. From this shaft 1400 tons a day are taken and 600 tons from the other three, or 2000 tons in all. The dumping arrangement used at this shaft was brought from Seraing, Belgium. It is located on a horizontal platform running from the shaft over the railroad tracks. Plain iron box cars are used, holding about a ton of ore. These are brought up by the hoist and drawn therefrom by an endless chain-conveyer running between the car-tracks on the platform. At the end of the platform the cars are run into the dumping device, which consists of an iron frame-work made of two large rings, one at each end, connected by four riveted cross-pieces, two of which are tracks for the car, and the two others are so adjusted as to make a tolerably close fit for the top of the car. The rings rest on four wheels, two of which are on each side of the platform. As the center of gravity is well up toward the top of a loaded car, as soon as it is run on the dumping-frame it begins to tilt, and the wheels supporting the frame greatly accelerate the movement. The car is completely turned upside down but cannot fall out of the frame. It is returned to the hoist by another track. Vertical shafts are now in use, but a new shaft which has just been sunk goes down on the foot-wall. This new shaft is the one in which quicksands were encountered and in which they were successfully pierced by the system of freezing introduced in this country by Sovysmith & Co. All haulage is done in the yards by power, no hand-pushing being observable.

The pump-house was visited for the purpose of examining the Cornish pumps at work there. There are two of these pumps, lifting 1300 gallons a minute a distance of 600 feet. They are operated by two Reynolds-Corliss engines geared to a double-crank shaft, with a pump-pitman at each end, so that the pumps work alternately. These engines are run by compressed air and are 24 x 48 inches, with one 20-ton fly-wheel. Auxiliary steam-boilers are at hand ready for use in case a breakdown should occur in the compressed-air system. Steam would then merely be substituted for the compressed air. Occasionally steam and air are used combined when the supply of air is too weak. Even the electric-light engine is here run by compressed air. Notwithstanding the efficiency of the power secured at this plant in this way, it is estimated by the officers of the company that about 75 per cent. of the power is lost in its transmission from the turbine wheels to the points of application. A large compound engine is now being built by Edward P. Allis & Co., of Milwaukee, to be used for both hoisting and pumping. It will operate 24-inch pumps and will be one of the finest and most powerful engines in the country, costing about $100,000. This costly addition to the plant of the company, however, will be merely in keeping with what they have done hitherto, their machinery and all their arrangements for handling ore being of the best character and presenting an air of finish and permanence often wanting about ore mines.

The ore now being mined by the Chapin Company was first discovered by Dr. Hulse in 1879. It is a soft red hematite, running from 62 to 64 per cent. in iron and 0.07 to 0.08 per cent. in phosphorus. It contains considerable moisture, which reduces the furnace yield of iron some 4 or 5 per cent. There are 1300 men on the company's pay-roll, and the output of the mines will be 500,000 tons. Next year it is expected that 600,000 tons will be reached.

The other mines on the Menominee range were not visited for lack of time. The vigor, however, with which mining operations are being pushed is shown by the record the Dunn Mine has made and expects to make. Last season it produced 125,000 tons, this year it will turn out 150,000 tons, and preparations are now being made to push next season's output up to 250,000 tons.

Up to the present the Menominee range mines have shipped over 1,250,000 tons, which will probably be expanded to 1,750,000 by the close of the season.

None of the mines on the Marquette range were visited by the party, as the time of their trip could not be extended so as to embrace that part of the Lake Superior ore field. It was learned, however, that the Marquette mines had up to the present exceeded last year's shipments between 30 and 40 per cent. Taking the total shipments of the four great divisions of the Lake Superior ore district, the shipments up to September 25 were 2,163,498 tons in excess of the shipments up to the corresponding date of last year. The total shipments for the month of September will be close to 1,000,000 tons, and for the season up to the present time they amount to over 5,500,000 tons. The percentage of increase over last year's shipments by each of the ranges is as follows: Vermilion, 181 per cent; Menominee, 70; Gogebic, 59; Marquette, 37. Between 7,000,000 and 7,500,000 tons will be shipped by all the mines this year. It is stated confidently by well-informed persons that from 9,000,000 to 10,000,000 tons could be shipped next year if that demand should warrant it.

The party returned to Milwaukee by way of the Milwaukee and Northern Railroad, arriving there on Thursday morning, when they separated for their respective homes, well satisfied with the results of their ten-days' jaunt.

In addition to the names published last week of those who participated in the excursions of the association, Major Charles E. L. B. Davis, of the United States Army, and William Lindsay, of Gordon, Strobel & Laureau, should be mentioned. T. W. Robinson, of Joliet, also accompanied the party during a portion of the trip.

A London exchange states that an electric lighting company, taking advantage of the present state of the Strand to lay their iron pipes, have made a very curious discovery. These pipes have to be carried to a considerable depth below both the gas and water pipes, and thus the workmen have come upon portions of the ancient wooden water-pipes of London, which have a bore of about 6 inches in diameter, apparently hollowed out of the trunk of a tree.

Academy and Home for American Ship-Builders.

Wm. H. Webb, of this city, who sailed for Europe last Saturday, is acknowledged by common consent to be among the most successful and distinguished of American ship-builders. In the exercise of a philanthropic spirit and a laudable ambition, Mr. Webb decided to found an academy and home for ship-builders, for which an act of incorporation was obtained from the New York Legislature last April. We learn that, pursuant to this purpose, architectural plans are prepared and a tract of 13 acres of land has been purchased on Harlem River for the site. It was intended to commence building this autumn, but absence in Europe until next spring for the recuperation of health makes it necessary for Mr. Webb to defer action. To provide against possible contingencies the institution has been endowed by donating by deed one-half of Mr. Webb's entire estate—all the law permits, as "the total value of the property held by said corporation shall not exceed $2,000,000"—and sufficient to erect the buildings and maintain the academy and home for future generations. More definitely stated, the object is "to afford free and gratuitous aid, relief and support to the aged, decrepit, invalid, indigent or unfortunate men who have been engaged in building hulls of ships or vessels or marine engines for such, or any parts of either the hulls or engines, in any section of the United States, together with the lawful wives of such persons, and also to provide and furnish to any young man, a native or citizen of the United States, who may, upon examination, prove himself competent, of good character and worthy, free and gratuitous education in the art, science and profession of ship-building and marine-engine building, both theoretical and practical, together with board, lodging and necessary implements and materials while obtaining such education."

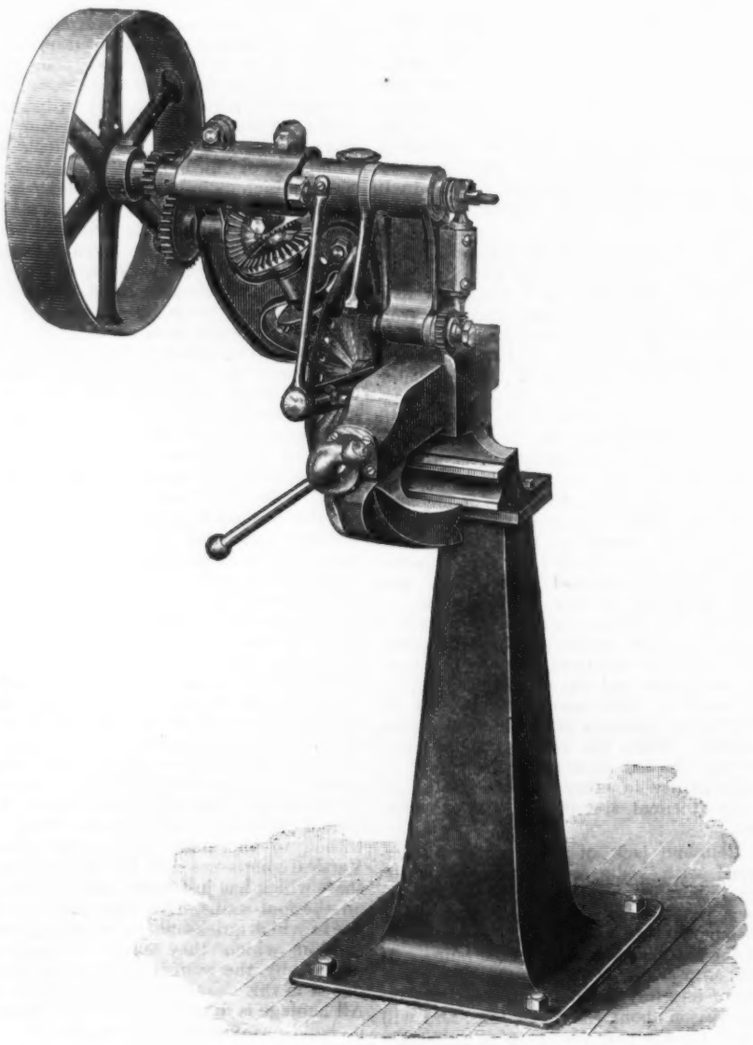
It will be observed that the scheme is on a munificent scale, worthy of its projector, and one that will add to the celebrity of the great metropolis.

The Owensboro Falls of Rough and Green River Railroad has just been opened to the public from Owensboro, Ky. to a small town some distance off called Fordsville. This is a short road and appears to be quite an insignificant one, but it is the means of giving an outlet to large bodies of the finest coal, iron ore and timber lands of the State. Eastern Kentucky attracts so much attention that few people except those interested recognize the existence of the magnificent mineral deposits and boundless timber regions of the southwestern portion. The coal is not a coking coal, but will be used largely for smelting without coking, being of a hard block variety. In addition to the above deposits there is an abundance of excellent building stones easy of access and particularly a very rich red sand-stone. The road is in good financial condition, as everything is paid for as completed, and no mortgage bonds at all have been issued on the property. The projectors, who are wealthy men, with the aid of a subscription from the city of Owensboro, have paid all expenses promptly, and will push the road to its present destination, the Falls of the Rough River, a small but powerful stream, which has a fine water-power.

The Third Avenue Railroad Company have obtained authority from the State Board of Railroad Commissioners to change their motor from horse-power to the duplicate-cable system. The streets will be cleaner and the use of salt in winter and of sand, now permitted by law, will cease. In Utica a horse-car company obtained permission to use the overhead electric system, the first application granted

Metal-Sawing Machine.

In the metal-sawing machine of which we herewith present two illustrations, the one upon this page showing the saw arranged to be driven by power, the one upon the following page the saw driven by hand, the most important feature is the method of driving the saw itself. The saw is formed with a series of holes placed in a circular concentric with the teeth and so shaped as to act as gear-teeth. The main driving-wheel is formed with cogs, which enter or engage with these openings, so that the action is precisely similar to that of a pair of gear-wheels. The driving-wheel is mounted upon a shaft placed at an angle to the plane of the saw and is driven by a train of gears leading from the pulley-shaft, as shown. The saw revolves over the work upward. As the power is applied to the saw near the periphery instead of near the center, a saw of steel softened so as to be filed will not buckle. The saw runs in guides which keep it perfectly steady. The point at which the power is applied to revolve the saw and the direction in which it moves are such that the work is done by a pulling and not a pushing movement, thus keeping the saw constantly under tension and obviating all danger that might result if it were pushed through the work. The saw performs its work in precisely the same way as a milling cutter. The frame which carries the saw and its driving-gear is mounted to swing, so that when through the cut the feed is released by the friction nut on the front, so that the saw can be swung back by hand and held there until the work has been taken out and new work put in, when the saw is locked to the work and the feed engaged The feed is operated from a worm and gear on the main shaft, the feed of the saw being attained by means of a segment-gear. The introduction of the friction-nut between the worm-gear on the main shaft and the segment-gear makes it impossible for the feed to exceed the strength of the saw. The work is held in an ordinary vise, the jaws of which are formed with an angular recess. The cut on the following page represents the same machine, except that the driving-pulley is replaced by cranks in order that it may be run by hand. It has been found by practice that the saw will cut a cross-section of 1 square inch per minute through iron and will average from 50 to 100 cuts before requiring filing. The machine is handled exclusively by J. J. McCabe, of 121 Liberty street, New York.

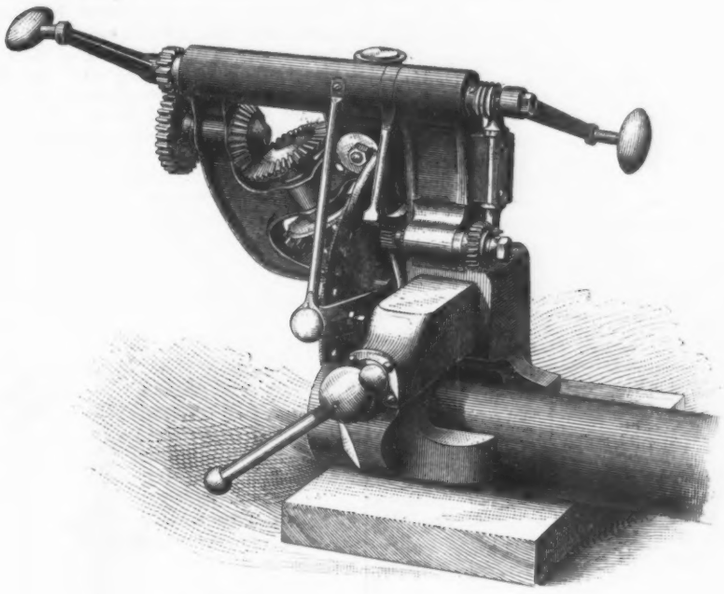


METAL-SAWING MACHINE DRIVEN BY POWER.

The New York State canals have increased their transportation business 400,000 tons this year as compared with last.

Open-Throat Shear.

The accompanying cut represents a foot-gap or open-throat shear recently placed on the market by the Niagara Stamping and Tool Company, of Buffalo, N. Y. In this machine the power is transmitted from the treadle to the cross-heads by forked arms hinged to the cross-head by heavy steel pins and having friction rollers running in the guides at connection with the pitman, thereby relieving the cross-head of the injurious side strain unavoidable in the old way of construction and which frequently caused the cross-heads to so wear the guides that of necessity it became out of true, necessitating the frequent adjustment of the table. The new form of treadle supplied with this machine is made from steel castings and is extremely light and yet has great power. It is provided with two lugs for connecting with the pitman, to increase the power when the pitman is connected to the rear lug. The legs are in one piece and the bed is adjustable. The shear is made with or without hold-down or extension tables and is made with a 15-inch gap capable of cutting 16-inch iron and lighter with ease, or in other words will slit to the middle of a 30-inch sheet. The knife-blades are ground true and the shear is fitted with back, front, side and bevel gauges. Another new feature is that the side gauges are inserted in a V slot, so as to be easily and quickly withdrawn out of the way when slitting long sheets. The engraving conveys a good idea of the general form of the machine.



METAL-SAWING MACHINE—HAND-POWER.

The German Government, following the example of England and France, has placed to the credit of the Navy Department the sum of 32,000,000 marks to be expended on new men-of-war. Of this amount 14,000,000 marks is on account of vessels now in course of construction, being the second appropriation for that purpose. The remaining 18,000,000 marks forms the first appropriation toward the building of two new ironclads, three cruiser corvettes, one cruiser and three dispatch boats.

The Bignall & Keeler Mfg. Company, of St. Louis, Mo., have lately completed for the firm of Ripley & Bronson, of that city, a duplex milling-machine for cutting and threading iron pipe from 8 to 16 inches inclusive. This is said to be the largest open or expanding die machine in the country, excepting one built by the same company for Crane Bros. Mfg. Company, of Chicago. It is triple-geared with all change gears cut from the solid and runs as quietly as a lathe. It has a gripping chuck on each end of the arbor graduated to the different sizes of pipe to be cut. The gripping jaws are flush with the face of the chuck, which enables the operator to handle very short pieces of pipe. A strong point noticed in this machine is the ease with which it can be worked. It is claimed that a boy 12 years old can operate it, making all the changes of dies, speeds, &c., without aid except that of an overhead carrier and tackle for handling the pipe. There are no heavy die blocks to change. A piece of 16-inch pipe 5 inches long can be threaded without the rise of a socket or other device save that of the machine itself. It has Bignall's patent Peerless die-head and micrometer adjustment. It is a very powerful, compact machine and weighs over 10,000 pounds.

FOOT-GAP OR OPEN-THROAT SHEAR.

The Thomson-Houston Electric Welding Company have done some exceptionally good work lately. We understand from reports in Boston papers that a $1\frac{5}{16}$-inch wire cable has lately been welded by electricity so as to give 86 to 87 per cent. of the strain of the unwelded cable. This, it is stated, is 6 to 7 per cent. higher than was ever obtained before, and is claimed to be considerably above the average obtained by the usual methods of splicing. The cables in question were the locked-wire ropes manufactured by Cooper, Hewitt & Co., at Trenton, the tests being made on the Watertown Arsenal machine. We are informed that in every case the breakage did not occur in the weld, but at a point about 1 inch back of it, where evidently the annealing action of the heating, due to the welding, had not penetrated.

The new dry-dock just opened at Halifax is large enough to receive vessels of any description.

Among the most prosperous of Southern States is Tennessee. Reports received from nearly all the counties show an increase of the value of real and personal property of $26,000,000 over the assessment of 1888 and an increase of $100,000,000 over the assessment of 1886. The increase of $100,000,000 in taxables in three years is claimed to be unprecedented in the history of any State in the Union.

Our Cisatlantic Trade.

The gathering of commercial delegates at the Congress of American Nations this month in Washington directs special attention to the trade relations between the United States and the several countries thus represented. It is readily conceded that the natural channel for the bulk of this trade lies on this side of the Atlantic rather than in the direction of Europe. And yet the United States fails to get more than a beggarly share of it, and that share invariably shows a heavy cash balance on the wrong side. That this disparity is not caused by lack of means of communication with these countries is proved by a table which appeared recently in the New York *Commercial Bulletin*, and which we reproduce herewith, showing that we have running out from the port of New York no less than 29 steamship lines, comprising about 125 iron vessels, with an approximate tonnage of 166,000 tons. These lines receive but a paltry compensation for mail service, the entire amount paid by the United States during the last fiscal year having been less than $70,000. Several receive liberal bounties from South American governments, the Brazil Mail Steamship Company, for example, receiving $100,000 per annum. They are mainly dependent on the transportation of freight as a source of revenue. One of the most prosperous lines is that to Venezuela, a purely American enterprise closely allied with the coffee trade. The American lines particularly are harassed by the invasion of "tramp" steamers, which are put on at seasons when freight is most plentiful in order to divide the profits. Excepting the old lines in the Havana trade and the Pacific Mail Line, which receives $60,000 a month as a sort of bonus from the competing railroads to California, these varied enterprises may be said, as a rule, to maintain a precarious existence. Paucity of freights rather than a lack of communication is the real difficulty to contend with in the South American trade, and the weak spot is the comparatively small volume of exports. We want not only natural products to exchange with the coffee, hemp, sugar and indigo of the tropics, but also the products of manufacture of skilled labor. When these latter can be put in the foreign market at a low cost and of a superior quality trade will prosper, and not before. We have the raw material and no lack of labor and fine machinery. Our natural resources are nowhere surpassed. Our mechanics are equal to any in the world. There is an abundance of freight room on our ocean steamers after discharging the inward-bound cargoes. How, then, shall the export trade be encouraged to offset the balance constantly accumulating against the importer?

American Vessels.

Line.	Tonnage.	Mails. Compensation.	Letters. Lbs.	Prints. Lbs.
Pacific Mail	26,026	$22,688.22	8,348	116,636
New York and Cuba Steamship Company	14,927	1,104.50	107 *391,305	296 *5,507,461
Clyde West Indies Line	4,000	1,131.50	*15,500 426	*201,741 5,529
Red "D"	9,270	6,178.61	2,593 *51,628	24,180 *472,961
Royal Mail	1,790	3,893.51	1,583	17,013
Morgan	11,242	703.58	334	2,124
Oteri's Pioneer Line (American steamers)	695	360.67	128	1,950
United States and Brazil	8,400	11,743.22	4,128 *2,585	64,112 *77,530
New Orleans and Colombia	1,800	14.89	9	6
Plant Line	1,625	.....	.....	.....
Tramp steamers and lines discontinued	.....	1,148.25	452	5,312
Totals	79,775	$48,966.95	17,108 *389,018	237,158 *6,259,693

* Grams.

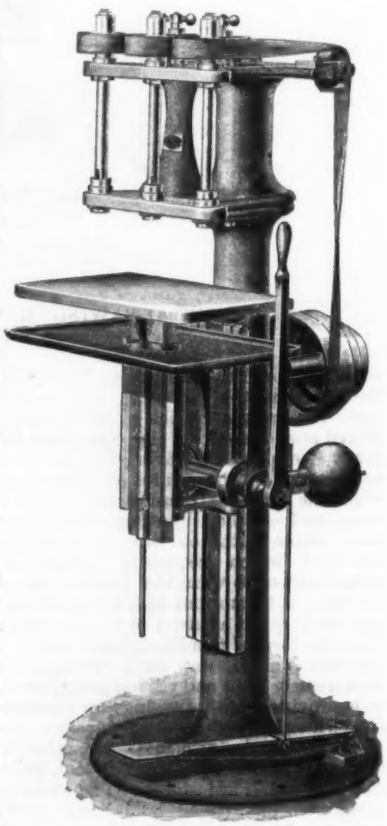
Foreign Vessels.

Line.	Tonnage.	Mails. Compensation.	Letters. Grams.	Prints. Grams.
Quebec Steamship Company	4,875	$1,703.85	1,442,904	13,590,278
Direct Line to Trinidad	2,870	8.27	2,870	57,050
Red Cross	3,000	189.20	107,486	885,838
Atlantic and West India	1,012	495.10	267,227	2,458,301
Honduras and Central America	2,013	319.03	159,740	1,708,551
Booth	7,694	110.03	76,075	379,520
New York and Jamaica	3,010	54.82	29,226	275,760
Atlas	22,600	2,173.05	1,113,156	11,386,955
Winchester & Co.:				
Porto Rico	2,070	49.22	11,931	40,000
Brazil, &c	1,000	53.05	18,493	364,797
Earn Line	3,000	24.16	14,013	110,166
Sloman's Line	5,200	.....	.....	.....
New York and Yucatan	2,200	3.96	1,750	23,555
Oteri's Pioneer Line (foreign vessels)	1,400	53.42	27,675	276,855
New York and Porto Rico	1,600	20.73	16,315	51,640
Taurus	612	22.46	17,395	58,750
Royal Dutch and West Indies	5,250	12.38	11,000	18,285
Compania Trans. Espanola	9,000	.....	.....	.....
People's Line to Hayti	1,500	.....	.....	.....
Anchor Line, West Indies Route	6,000	.....	.....	.....
Tramp steamers and lines discontinued	.....	1,861.89	747,698	11,917,632
Totals	85,996	$7,154.62	4,054,954	43,604,013

Two patents by Alexander H. Limont, of Waterbury, Conn., have recently been assigned to Holmes, Booth & Haydens, of New York. They relate to duplex tubing and the processes of making the same. The tubing shown is that bent up or formed of sheet-metal and represents one pipe within another, thus making the same pipe, so far as external appearances are concerned, serve two functions. In some instances, according to the drawings, the pipe is made with the inner pipe concentric with the outer pipe; in other cases the pipes are eccentric to each other, and in still other instances the inner pipe is round and the outer pipe square. The pipe shown is useful in combined gas and electric work and in other similar cases.

Endless-Belt Multiple-Spindle Drill.

The accompanying illustration shows a three-spindle drill just brought out by the Dwight Slate Machine Company, of Hartford, Conn., which is intended to meet the wants of drill-users whose work is of such a nature as to make it desirable for them to have a movable table operated by hand or foot lever. A novel feature of the tool is the method of driving the spindle. This is accomplished by means of an endless belt some 18 feet in length so arranged as to drive all the spindles. To provide for "take-up" of the belt necessary from wear or change of atmosphere two movable tightening-pulleys are provided. The advantages of this arrangement are many. The single long belt takes the place of the many short ones usually employed, and, being endless, runs smoothly and without the annoyances resulting from vibrations caused by the lacings passing over or around the pulleys. In addition, the belt has a contact of one-half to two-thirds the circumference of the driving-pulleys, thereby insuring a continuous steady motion in spite of any variation in the work, this result being obtained with a minimum of belt tension. Another improvement noticed is in the manner of driving the spindle. This is done by feather and bushing in the upper end of the pulley-hub, which runs outside of the spindle, but which has its bearings on a fixed stud in the frame. This takes all the strain from the spindle that is incident to belt-tension when the pulley is placed on the spindle itself. The capacity of the drill shown is from 0 to $\frac{5}{8}$ inch. The spindle-steel is $1\frac{1}{8}$ inches in diameter and chucked for Morse No. 2 taper. The spindles are $6\frac{1}{2}$ inches from center to center and will drill to the center of a 16-inch circle. The greatest distance from the bottom of the spindle to the top of the table is 20 inches. The weight of the drill is 650 pounds. The above company will shortly bring out a 4 and a 6 inch spindle drill of the same general design.



Multiple-Spindle Drill.

THE WEEK.

The National Board of Steam Navigation, lately in session in Pittsburgh, elected these officers: President, J. W. Miller, of New York; vice-presidents, B. D. Ward, New Orleans; A. F. Churchman, Philadelphia; treasurer, Addison Lisle, Pittsburgh; secretary, J. W. Bryant, New Orleans; assistant secretary, C. H. Boyer, New York. New York was selected as the place of the next meeting.

Leading Spanish newspapers, in commenting upon the International American Congress at Washington, unite in expressing the hope that the Spanish American republics will not allow themselves to be made satellites of the United States.

The kitchen range and other appliances connected with the dining-car service on the New York, New Haven and Hartford Railroad have been abolished. A quantity of live coals would be dangerous in case of accident.

John H. O'Rourke obtained the contract for erecting buildings at the St. Johnland farm, in Kings County, at his bid of $627,000.

The New York Mercantile Exchange adopted resolutions against locating the appraisers' stores at Bowling Green and the Chamber of Commerce voted down a resolution to approve of Secretary Windom's selection of that site.

The fifty-eighth annual fair of the American Institute was opened with a large attendance. The machinery department is now nearly complete.

There are plain indications that holders of stock in the Sugar Trust are hastening to unload, about 330,000 shares having been sold since the decline began, some three months ago. The original appraisal of the works purchased, with their goodwill and established business, was said to be about $15,000,000 in all, or 30 cents on the $1 of stock issued. Dividends of 10 per cent. have been paid and a surplus said to be $15,000,000 accumulated through skillful manipulations, a part of which has been lost. The building of independent refineries and possible hostile legislation by Congress have an intimidating effect.

A telegram from the Mexican capital says Englishmen are endeavoring to obtain control of all the iron-works in the republic outside of the Durango Iron Mountain, and hope to manufacture railway materials under special encouragement from the Government.

The United States Circuit Court in San Francisco decides that the seizures of sealers in Behring Sea by the United States revenue authorities were legal and that the skins may be lawfully confiscated.

Tax-payers in New York City take umbrage at the arbitrary advance in the valuation of property in the county of New York by the State Board of Equalization. Comptroller Myers is much incensed. He said: "They have put up the valuation of property in the city and county of New York $119,425,063 above last year's rate of valuation. This advance is more than the valuation of property in any city or county in the State except Kings and Erie counties, and it has been made without warrant, without reason and without consultation with the authorities of this county. There is no justice in it whatever. Indeed, the assessment of the city and county of New York is very nearly one-half of the assessment of the entire State. The whole State assessment is $3,567,429,757, while the assessment of this city is $1,615,244,434. The assessment of Erie County is only $132,000,000 and that of Kings $373,000,000. The board have deducted $22,830,163 from Kings County, while they have added $119,425,063 to New York. And every year they keep putting us up $100,000,000. How is it possible for the officials of the city of New York to keep taxes down while the State Board of Equalization keep adding to our assessment in this outrageous manner? We will have to pay $1,300,000 more taxes to the State this year than last year. In order to do this we will have to increase our tax-levy, already determined on."

The president of the Chicago Chamber of Commerce states that work will be commenced this autumn on the canal which is to connect the Illinois River with the Mississippi River, and within three years Chicago will run steamboat lines to Nashville, Memphis and New Orleans.

A bill advocating subsidies to American ships will be introduced into the next Congress by Representative Farquhar, of New York. Its principal feature will be the allowance of 30 cents per ton for every thousand miles traveled by an American ship and the admission of a free cargo on its return trip. The subject is likely to receive much attention.

Cleveland proposes to open the old riverbed in that harbor to meet the demands of trade, but the Cleveland and Pittsburgh Railroad Company claim to own the submerged land, having paid taxes on it for a number of years, and fixed the valuation at $300,000.

Mr. Powderly says that while he believes in a shorter day he will not recommend an eight-hour strike. Arbitration alone, he declares, can bring about the object desired. Respecting the financial condition of the knights, Mr. Powderly says it is better than ever before.

The announcement is made in Montreal that the Grand Trunk Railway are about to secure a short line to the Atlantic seaboard wholly on Canadian territory and shorter than the route of the Canadian Pacific through Maine.

Boston steamers for Europe are going out full of cattle at advanced rates of freight.

The International Marine Conference meets in Washington city the 16th inst. There will be about 50 delegates in attendance, and 23 countries have already indicated their acceptance of the invitations issued by the State Department. The chief object is to secure improvements in signaling and policing the sea which shall bring greater safety to navigation. Rear Admiral Franklin is president of the American delegation, who number seven.

A St. Petersburg dispatch says that the Russo-Japanese treaty of commerce, which has been submitted to the Czar, alters the Japanese tariff system. Henceforth duties will be levied upon articles separately specified, instead of on gross bulk as imported.

The Hebrews in New York are estimated to number about 80,000, most of them enterprising traders, with a peripetatic tendency.

At the Pratt Institute in Brooklyn "Founder's Day" was observed last week with appropriate exercises, and an address by Charles Pratt was naturally the principal feature. The aim of the institute, Mr. Pratt said, was to give facilities for a trial of the best type of combined academic instruction and manual training for boys and girls from 14 years of age to 17 or 18. The idea was not to teach them any trade, but to educate them to work patiently and systematically in the use of hand, eye and brain. Such as finished this course, Mr. Pratt thought, would be able to decide what they were best fitted for in life's work. During the past year, Mr. Pratt said, over 30 persons had gone out of the institute who were now earning an average of $500 a year, or more than the interest on $500,000 in Government bonds. To teach the graduates saving habits it had been determined to form an association to be known as "The Thrift," having for its aim the encouragement of thrifty habits. The members of the association would be able to obtain from it advances to enable them to buy homes instead of paying rent, and would participate in other advantages.

The new Tremont Temple just opened in Boston has an entire flooring of corrugated iron, covered with concrete.

St. Paul's tax rate is definitely fixed at 13 mills, the lowest ever levied in that city.

Town lots in Pierre, selected as the capital of South Dakota, are held at exorbitant prices.

The British steamer Earnmoor foundered in a West Indian hurricane, her engines being powerless to keep her head to the storm, and 19 men were drowned.

Chief Engineer Loring has been ordered to inspect the Pond Machine Works, at Plainfield, N. J., and report on the capacity of the works and the character of the work so far as ship construction is concerned.

The Mississippi steamboat interests and river commerce generaliy in the West have been more prosperous this season than before for seven or eight years.

The discussion regarding the best method of increasing the capacity of the Brooklyn Bridge still continues. Better terminal facilities are possible, and when provided trains can be dispatched with headway of three-qarters of a minute. Concerning the desirability of increasing the capacity of the bridge itself by building an overhead track, Col Wm. A. Roebling states that this cannot be done, as the cables would be overloaded, and that their strength cannot be augmented, since they are now strong enough to overturn the anchorages. Although the deadweight in the anchorages could be easily increased, that plan is not thought desirable.

A fine exhibition of workmanship in metals was made by boys in the Cleveland Manual Training School. Among other objects were two 3 horse-power engines made by the pupils.

Commodore Walker will take to Europe the first American fleet of steel cruisers.

In an injunction suit to restrain the building of a railroad in Ohio across the lands of the Standard Oil Company the plaintiffs urged that an oil or a gas lease carried with it absolute control of the premises for all purposes save those of agriculture. Judge Pendleton, of the Court of Common Pleas in Hancock County, decided that the leases conveyed only the right to use so much of the surface as may be necessary in developing and utilizing the oil beneath.

Scanlan Brothers' abbatoir, on Fortieth street in this city, was wrecked by a bomb which exploded in the office. The proprietors attribute the outrage to disaffected workmen who had been discharged for alleged misconduct. Their safe at the time was filled with boycotting circulars. The locality is near Stevenson's brewery, where an explosion was attempted not long ago under circumstances almost identical. It is remarked as a strange coincidence that in three strikes in which District No. 49 has been concerned explosions have taken place.

MANUFACTURING.

Iron and Steel.

Wellston Furnace No. 2, at Wellston, Ohio, under lease to King, Gilbert & Warner, of Columbus, will soon be put in blast. At present it is undergoing repairs of an extensive character.

The official investigation of the causes of the accident at Furnace C, of Carnegie Bros. & Co., Limited, at Braddock, Pa., was concluded by the coroner of Allegheny County last week. The testimony of J. Gayley, superintendent of the blast-furnace department, was perhaps the most important and was substantially to the effect that he was on duty at the time of the accident. The men were trying to work out the cinder. The furnace was too cold for the cinder to run. While working he heard a hissing sound and then saw a flame just above their heads. He did not discover any weakness in the furnace. It was looked on as one of their most substantial furnaces. The weight of the cinder in the furnace at the time was about 6 tons, but it was not up where the break occurred. In the manufacture of Bessemer iron there never was an accident of the kind before. The witness said it was impossible to tell what caused the accident. After hearing some of the additional testimony the jury returned a verdict that the death of the victims was purely accidental and that all proper precautions had been taken about the furnace.

The Paige Tube Company, of Warren, Ohio, are making arrangements to light their works with electricity. They expect to start up not later than the 20th inst., and will give employment to about 400 hands. The above concern are successors to the Warren Tube Company, having purchased their plant and made extensive improvements to it.

Carnegie, Phipps & Co., Limited, of Pittsburgh, will soon make some important improvements in their Homestead Steel Works, at Homestead, Pa. The most important will be the increasing of the size of rolls so that 30-inch beams can be rolled. This plant is being operated to its utmost capacity at present.

Ground has been broken for two 150-ton furnaces in Middlesborough, Ky. Work will be pushed vigorously to completion. It is stated that Eastern parties are offering to erect two 50-ton charcoal-iron furnaces at the same place. Cable advices last week from London report the organization there of a strong company to carry on iron and steel manufacture at Cumberland Gap. After drifting 325 feet into the mountain a vein of Oriskany ore has been found on the property of the American Association at Cumberland Gap. It is claimed that it is Bessemer ore. This horizon of ore is in addition to the horizon of Clinton and limonite ores already opened up in large quantities.

At Pittsburgh last week a bill in equity was filed by the Cherry Valley Iron Works, A. Wilcox & Co., First National Bank of Pittsburgh, Allegheny National Bank, Chess, Cook & Co., McIntosh, Hemphill & Co., Howard Hartly and the A. Garrison Foundry Company, creditors of the firm of Graff, Bennett & Co., against James Pickand, J. W. Friend and J. M. Bailey, trustees for certain of the creditors and Graff, Bennett & Co. The bill contains the same allegations as were made in the exceptions to the account of the Hon. J. H. Bailey, assignee of Graff, Bennett & Co. It is stated that the property of Graff, Bennett & Co., including the Millvale and Clinton Iron Mills, was sold by Assignee Bailey to Pickand, Friend and J. M. Bailey for $25,050. That Pickand, Friend and Bailey, to depress the value of the property induced intending bidders to withdraw by paying them money and other considerations. As a consequence they were the only bidders and obtained the property at their own price. The proceedings, it is alleged, were a fraud on the other creditors. The property was worth at least $500,000, and had the bidding been free would have brought at least $200,000. All the remaining property of the firm in the hands of the assignee and the proceeds from what has been sold will not pay more than 20 per cent. of the claims of the creditors. The assignee, J. H. Bailey, was asked to commence proceedings to recover the property for the benefit of all parties interested, but he refused. They state that he is a brother of J. M. Bailey, one of the purchasers. They now ask the court to declare the sale and deed of the property to be null and void, to appoint a receiver to take possession of it, and that Pickand, Friend and Bailey be compelled to convey the property to them. Also that an injunction be issued restraining them from selling or disposing of any of the property.

Furnace F, of Carnegie Bros. & Co., Limited, at Braddock, Pa., which has been idle for some time undergoing repairs, has resumed operations. This is the furnace whose dome is surmounted by a broom placed there by the late Captain Jones several years ago to signify that it swept the record, or turned out more iron in one day than any one furnace in existence. Its best record is 464 gross tons of pig-iron in 24 hours. All the furnaces of the above firm, nine in number, are now in successful operation. Work is progressing rapidly on the two new stacks now being erected at Braddock. It is expected that they will both be in operation before April of next year.

Salem, Va., is to have a blast-furnace. The company have been incorporated as the Salem Furnaces and have been organized with the following officers: D. B. Strouse, of the Bonsack Machine Company, president; F. H. Chalmers, secretary; John M. Evans, treasurer; F. E. Bachman, superintendent. Board of Directors: C M. Clark, of E. M. Clark & Co., Philadelphia; Chas. G. Eddy, vice-president of the Norfolk and Western Railway; James A. Bonsack, F. E. Bachman, J. W. F. Allemong, T. J. Shickel, John M. Evans, F. H. Chalmers and D. B. Strouse. The contract for the furnace, 14½ x 75 feet, has been let to the American Bridge Company, of Roanoke, Va.

The National Forge and Iron Company, East Chicago, Ind., were delayed in starting their new rolling-mill and were unable to begin to roll iron until the 3d inst. The 10-inch mill was then started on ⅞-inch round iron, and worked so smoothly and satisfactorily that 150,000 pounds of finely finished iron were turned out in 11 hours. Mill men of long experience witnessed the start and were surprised to see the new machinery work so well. The 18-inch mill was not put into operation until this week. The members of the company are highly gratified with the auspicious beginning which the mill has made.

H. W. King, formerly connected with Graff, Bennett & Co., of Pittsburgh, proposes to erect a blast-furnace at Roanoke, Va., and has invited several furnace-builders of Pittsburgh to bid on the work.

An error crept into our statement in regard to the contemplated second stack for the Pulaski Iron Company. The furnace of the company is located at Pulaski City, not at Roanoke, and it is there that the second furnace will be built.

Furnace No. 3 of the Glendon Iron Company, Easton, Pa., Morris P. Janney, superintendent, turned out for the week ending September 28, 1889, 824½ tons of iron, chiefly gray forge, with 801$\frac{12}{16}$ tons of fuel, one-fourth coke, three-fourths anthracite, giving a fuel consumption of 19 hundred-weight 1 quarter 22 pounds per ton of iron. No extra scrap was used. The furnace is 81 feet high and 18 feet bosh.

Machinery.

The A. Garrison Foundry Company, of Pittsburgh, recently cast a very large roll, the dimensions of which are as follows: Diameter of body, 34 inches; length of body, 120; diameter of journals, 24; length of journals, 20; coupling ends, 20; diameter, 9 The weight of this roll is 40,000 pounds.

The Laidlaw & Dunn Company, of Cincinnati, Ohio, have sold another 300 horse-power Galloway boiler to the Geo. H. Friend Paper Company, West Carrollton, Ohio. This makes three of this size they have sold to this concern within a year.

Seaman, Sleeth & Black, proprietors of the Phœnix Roll Works, at Pittsburgh, are enjoying an excellent demand for the rolls and various kinds of rolling-mill machinery made by them. The capacity of the works is about 50 tons per day, but it has been necessary to operate the plant day and night to keep pace with their orders.

The Enterprise Boiler Company, of Youngstown, Ohio, will soon commence the erection of an addition, 45 x 130 feet, to their present works. This has been made necessary by the demands for the manufactures of the firm, and which, with their present facilities, they are unable to meet.

Nicholson & Waterman, of Providence, R. I., builders of bolt and nut machinery, boring and drilling machines, &c., are full of orders for their regular and special machines. Their drafting-room is pushed to its utmost working up the drawings for the latter.

We have just received the October calendar presented by the Universal Radial Drill Company, of Cincinnati, Ohio, who take this method of kindly remembering their friends and bringing their latest improvements in drills, lathes, &c., to their attention. This month's calendar presents a plain engraving of their heavy countersinker, which has a clear overreach of 36 inches.

An electric locomotive of somewhat novel design has just been built at the New York Locomotive Works, Rome, N. Y., for W. H. Darling. The storage system is used, the batteries occupying what would be the fire-box in an ordinary engine. The reciprocating movement of the pistons is caused by currents in helical coils wound about the cylinder, the construction being founded upon the principle that an iron plunger will be drawn into a coil of wire through which an electric current is passing.

A. B. Bowman, St. Louis, Mo., dealer in machinery and machinery supplies, has a very interesting exhibit at the exposition now being held in St. Louis. Prominent among the machines displayed are noted the following: Three sizes of Lodge, Davis & Co.'s engine lathes, a cabinet turret lathe for brass finishing, made by Lodge, Davis & Co., and a 26-inch geared-shaper and 15-inch crank-shaper, also made by Lodge, Davis & Co. A two-spindle Dwight Slate Machine Company sensitive-drill, also a 27-inch by 7-foot Wheeler planer.

The Wheelock Engine Company, of Worcester, Mass., are extremely busy. Work has been begun on their new shops, and contracts have been let for boilers, shafting, &c. They have recently shipped a 350 horse-power engine to St. Louis to run the Short system electric railway; a 350 horse-power condensing en-

gine to the Agawam Paper Company, of West Brookfield, Mass., and a similar engine to the Odell Mfg. Company, of Concord, N. C.

In the last issue of *The Iron Age* a typographical error crept into the notice of the Broderick & Bascom Company's award of the contract for supplying the cable for the Citizens' Railway Company, St. Louis. The item read 5000 feet, but should have been 50,000.

Ludlow-Saylor Wire Company, St. Louis, Mo., report an active trade in bank railing, cemetery and lawn inclosures. The trade in wire tree-boxes is also large, and they inform us their business for September shows a large increase over the corresponding month of 1888.

By treating raw hides by a special process and subjecting them to great pressure the New Process Raw Hide Company, of Syracuse, N. Y., make pinions which serve the same purpose as those of metal and which are noiseless. The teeth can be easily and perfectly cut. For high-speed gearing rawhide gears are especially adapted.

W. H. Warren, of Worcester, Mass., has just completed for the Government two patent 26-inch stroke shaving-machines, which will be used on the large guns now building at the Washington Navy Yard. Mr. Warren is also building one of his largest radial drills for the U. S. arsenal at Watertown, and is building another large radial drill for parties in England, to whom he has already shipped a number.

F. E. Reed, of Worcester, Mass., builder of machine tools, has had plans drawn for an addition to his machine-shop.

The Edison Machine Works, of Schenectady, N. Y., have commenced the erection of large works. About 1300 men will be employed in the new buildings.

The new shop just finished by the L. W. Pond Machine Company, of Worcester, Mass., measures 200 x 40 feet and is three stories high. An excellent light is obtained from large windows on three sides. The shop will contain many improved tools and will be lighted by electricity.

The new automatic high-speed engine built by the Bryant Safety Engine Company, of Rochester, N. Y., is somewhat of the character of the Shipman and Acme oil-burning engines. It has a cast-iron sectional boiler, in which provision is made for expansion and contraction. A rocking-valve is used. It has an ingeniously-arranged governor in direct connection with the connecting-rod, which renders the control very sensitive. The engine has given excellent results in service.

The Moore Mfg. and Foundry Company, of Milwaukee, Wis., will probably use their present foundry for a machine-shop and erect a new foundry building.

The Hughes Steam Pump Company, of Cleveland, Ohio, are working night and day. Judging from present indications it is probable that this condition of affairs will be maintained for some months.

A steam-engine of 1000 horse-power, embracing all the latest improvements, is now under construction at Fishkill-on-the-Hudson for the new grain elevator of the New York Central and Hudson River Railroad Company, located at Sixty-third street, New York.

From the Brown & Sharpe Mfg. Company, of Providence, R. I., we have received a very fine engraving giving a bird's-eye view of their extensive establishment. Some idea of the magnitude of the works may be formed from the following figures: The foundry covers 23,500 square feet; the machine-shops, 138,110 square feet; the storage-sheds, 13,306 square feet, while the total floor-space of the buildings is 4 acres.

The Babcock & Wilcox Boiler Company, New York, are furnishing the boilers for the new mill of the Providence Worsted Company, Providence, R. I.; also for B B. & R Knight, of Providence. They have the battery of 7500 horse-power for the Spreckels new sugar refinery at Philadelphia completed.

The Penberthy Injector Company, Detroit, Mich., were exhibitors at the International Fair and Exposition recently held in that city.

The Hill Clutch Works, of Cleveland, Ohio, are making preparations for building a large extension to their present works. The addition will be used as a storing and shipping room.

Hardware.

The Hubbard Company, of Pittsburgh, manufacturers of axes and shovels, are about to commence the erection of an electric-light plant at their works at Beaver Falls, Pa. This will enable the firm to operate their works at night should occasion require.

Among the exhibits at the Detroit International Fair and Exposition, recently held in Detroit, Mich., the following manufacturers were prominent in the attractiveness and excellence of their displays :

Fulton Iron and Engine Works had a representation of the product of their works, the Detroit tools, the Sure-Grip Tackle-Block, the merits of which were tested by an attendant, tire-shrinkers, upsetters, Cheney anvils, vises, &c.

Detroit Steel and Spring Works gave an attractive showing of their manufacture of fine tool and spring steel, carriage and spiral springs of various descriptions.

Adjoining these exhibits was that of the Michigan Steel Works, with an elaborately arranged display of light and heavy steel castings in large variety.

The Michigan Bolt and Nut Works occupied a liberal space on the main floor, and were conspicuous by the tasteful arrangement of the line of nuts and bolts of their make.

The Gibbs Lawn Rake Company, Canton, under recent date advise us that their business for the past year was far in excess of that of any previous year, having been so crowded for room that they were compelled to seek a new location, and are now busily engaged in erecting a new factory which, when complete, will give them triple their former capacity. New and special machinery is being placed in position and all arrangements are expected to be completed by October 10.

The John A. Roebling's Sons Company, of Trenton, N. J., have two months' orders ahead for wire nails, barb wire, wire rope, &c. They have completed a new wire-mill having a capacity of 15,000 tons a year.

Miscellaneous.

The Consumers' Heating Company, of Pittsburgh, with a capital stock of $50,000, were chartered last week. The company propose to bore for natural gas in Ross Township, Allegheny County. The directors are Robert Dupuy, David Show, A. H. Clarke, Robert J. Anderson, Robert Josephs.

Last week the H. C. Frick Coke Company, of Pittsburgh, concluded negotiations for the purchase of the Fayette and Kyle Coke Works, in the Connellsville region. This acquisition gives them control of all the works south of Uniontown and swells their holdings to nearly 8500 ovens. The Fayette Works were owned by the Fayette Coke and Furnace Company. The plant consists of 130 ovens and 275 acres of coal. The price paid was $185,000. The sale does not include the Oliphant Furnace, which will continue to be operated by the firm. The Kyle Works were owned by the Kyle Coke Company. The plant consists of 127 ovens and 275 acres of coal.

A contract has been made with the Tacony Iron and Metal Company to complete the City Hall tower in Philadelphia at a cost of $325,000. All the material and labor are to be furnished at an advance of 15 per cent. on the actual expenditure.

The Gaylord Electric Company, of Louisville, Ky., have recently taken the contract of supplying the street-car companies of Nashville, Tenn., with electrical equipment. The contract amounts to over $100,000 and is the largest of the kind ever made in the South. The system is to be the Sprague.

The bridge trustees are to build repair-shops beside the car-station between High and Nassau streets, Brooklyn, at a cost of $12,000.

The Kentucky Wagon Mfg. Company, of Louisville, Ky., will, on January 1, acquire the good-will, stock and machinery of Cherry, Morrow & Co., of Nashville, Tenn., manufacturers of the Tennessee wagons, and both the latter brand and the celebrated Old Hickory wagons will be manufactured at the South Louisville shops of the consolidated companies. Recently the local firm closed a contract with the Nashville parties for 8500 of the Tennessee wagons, being all the stock now on hand and that will be manufactured by the 1st of January. The consideration was about $300,000. The Kentucky Wagon Mfg. Company for the past six weeks have been running double time, the immense buildings and yards being lighted by their own electric plant.

According to a report of the State Auditor there has been a decline of 134,579 in the number of sheep in Ohio in the last year. It is not profitable to raise sheep on land worth $150 an acre, in competition with wool-growers on the mountain ranges of the Pacific Slope who get their land for next to nothing.

Another Hudson Bay route is talked of, from the Canadian "Soo" north 370 miles, crossing the Canadian Pacific at Windermere, through timber, mineral and fine coal lands. The projectors claim that it is one-third shorter than the Winnipeg route.

Inquiry at the office of the various steamship lines in this city brings out the fact that nearly 45,000 passengers sailed from New York for European ports during the last four months, and that since February 1 the aggregate of departures exceeds 80,000. A large proportion had Paris for their ultimate destination. According to one estimate the number of American visitors to the Paris Exposition is equal to the total here mentioned.

One of the remarkable features about architecture in New York at present is the rapidity with which buildings are completed, particularly the great office buildings in Wall street and elsewhere downtown. Formerly the construction of such buildings was a matter of years; now they are finished and occupied in a few months after the foundations are laid. Nine and ten story buildings which were only begun in June are now ready for their occupants.

The Iron Age

New York, Thursday, October 10, 1889.

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CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

A Boom Not Wanted.

In the estimation of the thoughtful members of the trade, the greatest menace to the future healthy condition of the iron and steel industry is the danger of a radical advance in prices now impending. We have in previous issues pointed out the evils which would follow in the train of a boom, but the matter is of such importance that we would not be performing our whole duty if we did not endeavor still more urgently to check the movement. Within the past week sensational dispatches have been sent out from Pittsburgh which are well calculated to excite consumers and to hasten the advance in prices which the inconsiderate are welcoming. The daily press adds to the effect of these statements by glaring head-lines, as though it were necessary to impress the country with the belief that the iron trade was in a mad whirl of excitement.

While every iron and steel manufacturer desires prices to be maintained at a point which will yield him a fair profit on his operations, it may safely be assumed that there are very few who wish to see extravagant rates prevail. Opinions differ widely as to what constitutes a fair profit, but when the state of trade is such that all works well located can market their product without competing so vigorously with one another that prices are cut, there can be no doubt that a margin of profit exists. This satisfactory stage of affairs has been reached and passed, and the producer now seems to be master of the situation, able, if he wills it, to compel consumers to pay him a yet larger profit. In view, however, of the future condition of the iron trade, it would seem the part of wisdom for every producer to hesitate before he adds another dollar a ton to the price of his pig-iron, his bar-iron or his steel. Every point now scored in the upward movement is a warmer invitation to idle blast-furnaces or rolling-mills to resume activity. Much higher prices will cause new enterprises to be undertaken where none now exist. Inevitably the supply will overtake the demand, then greatly exceed it, and prices will fall below the point of profit at even well-located and well-managed works, to recover their proper equilibrium only after the long and expensive process of "weeding out" has been endured.

Scarcity may really exist at present in a few special branches of trade, but in staple lines there is no danger of a famine, and no need is apparent for apprehension among buyers. Those who have sold their product without covering their requirements of raw material are probably very few in number in comparison with the great mass of consumers, and if these few buy heavily because they fear further advance the others should not take alarm and buy also without fully considering why they need follow. If they can afford to speculate and have the inclination to do so, that is another question. But they need not worry themselves yet about a probable scarcity. Interviews with leading pig-iron commission houses have elicited the information that their customers are being supplied without difficulty unless they desire special brands, and these, it is true, are not so easily obtained as a short time since. New furnaces, however, have their opportunity to secure a favorable trial of their product.

Consumers are responsible for a considerable part of the advance in prices which at the same time they condemn. It generally happens, and is probably a failing of ordinary human nature, that at a time of advancing prices consumers will insist on placing orders for future requirements with works so well sold that a higher rate is established almost without intention on the part of the seller. If consumers should not permit themselves to be over-influenced by fears of having to pay very high prices and will adopt the policy of buying only what they really need, there will be a conservative influence exerted throughout the market which cannot but have its effect. It is to their interest to have a stable iron market, free from violent fluctuations. If a further advance on staple goods can be checked, the present prosperous condition of the iron trade and its related industries will continue much longer than would otherwise be the case. Higher prices, however, will entail higher rates for raw material, freights and labor, because all interested will expect and ought to have their fair share of the profit reaped; but the return to a lower basis, which is inevitable, will be the more difficult the higher prices are permitted to climb.

The key to the situation, singularly enough, appears to be held by Southern iron-makers. They are less affected, as to the cost of their product, by outside influences than are Northern makers. They almost invariably control their own supplies of raw material, are favored with more tractable workmen, and have the railroads of their section co-operating with them and working in their interest. They can, if they feel disposed, check the threatened advance by selling their iron ahead more liberally, thus making consumers less apprehensive of the future. A Northern manufacturer, however, could not safely carry out such a policy, as he purchases his raw materials, depends upon railroads which regard his location on their line as a mere incident, and finds his workmen influenced often in their demand for higher wages by the course of other industries. It would be decidedly hazardous in the present condition of the market for Northern furnaces to do what their Southern colleagues can apparently do with impunity. But as far as it can be safely done, the manufacturers of all sections should now allay the growing apprehensions of their customers with regard to the future rather than excite them by creating a fictitious scarcity.

The advancement of the material interests of the South is well displayed in the growth of the railroad investments of that section. The principal lines have been extended into new territory to secure enlarged traffic, feeders to main lines are being built to open up hitherto neglected sections, and new roads of ambitious proportions are projected. The promise of lucrative returns from former investments in Southern railroad and manufacturing property having been realized in numerous enterprises, the confidence of capitalists has been secured and it would not be remarkable if the next five years witness even greater growth than that shown in the past five marvelous years. Not alone in the Southeastern States, but in the Southwestern section a great deal of work is being prosecuted at present in railroad-building. In Arkansas, Louisiana and Texas there are 989 miles of road in process of construction, 836 miles additional have been located or surveyed, and there are projects of some promise which foot up over 3300 miles.

Cheap Nickel.

To the metal trades, the only paper of interest read at the Ottawa meeting of the American Institute of Mining Engineers was that on the Sudbury nickel and copper deposits, read by Dr. Edward D. Peters, Jr., who is in charge of the operations of the Canadian Copper Company. The latter title is evidently a misnomer, growing out of the ignorance of the presence of nickel in the ore in the early days of the enterprise. Dr. Peters himself in his paper carefully abstained from giving data bearing on the commercial side of the question, dealing only with broad statements and description technical in their character. But some data were learned from other sources which reveal the fact, already expressed in declining prices for the metal, that nickel will come within the purchasing powers of a far greater number of consumers.

The situation, we believe, will become sufficiently clear when we state that the average total consumption of the world of pure nickel is about 1000 tons per annum, of which one-third is credited to the United States. With two furnaces only, the Canadian Company are producing from, say, 250 tons smelted, daily, matte carrying about 5¼ tons of pure nickel, or say 1600 tons of that metal annually. There seems to be little doubt that that quantity can be made at a very low price, particularly since its production is accompanied with the output of about 2500 tons of copper, which will probably go far toward paying the cost of mining and reduction.

It is stated that even at present prices the most formidable of the world's producers hitherto, the company working the deposits of Noumea, New Caledonia, confess their inability to compete. Even when it is admitted that such tales of woe are to be taken with some allowance, the fact remains that the Sudbury mines can control the market, force competitors to close down, and yet at their present rate of production supply the markets of the world with more of the metal than it has been accustomed to take. They are now exceeding consumption by 600 tons at least annually, even if no other producer makes a pound. It becomes a question, then, in which a good many people outside of the directors and stockholders of the company are interested, how low the price must go in order to push the excess into the hands of actual consumers. Nickel

undoubtedly has a great intrinsic merit as a metal. It possesses valuable qualities peculiarly its own. At a low price new channels of consumption will be opened to it. Let us assume that it drops down below 50 cents a pound. Will twice as much of it be consumed at that figure as there was when it was hovering near $1 a pound? The experience of the New Caledonia interests certainly does not encourage that belief. It is pretty well known that in the early days of the development of the deposits of the antipodes the markets of the world were quickly overstocked and that the metal could not be moved in spite of liberal concessions.

The policy of those controlling the Canadian deposits will shape the future of the nickel market. The magnitude of the deposits may induce the men interested to work on even a larger scale than they are now doing. They are understood to be men who are familiar with and inclined to great undertakings, who are conscious of their ability to market the metal profitably as low as 20 to 25 cents a pound. At a hearing before the Senate committee Samuel J. Ritchie, of Akron, Ohio, who is connected with the company, claimed that that figure could be met. The managers may decide that their best interests demand a heavy production, coupled with low prices, in order to create a much broader market than now exists. Any further additions to the Sudbury plant may be interpreted as indicating that such is to be the policy to be followed.

We are inclined to receive with doubt the off-hand assertion that the assurance of a much lowered range of values for any metal is reflected by an immediate and spontaneous development of the consumption. The same trouble which has been and will be found with aluminium will hamper nickel. We do not doubt that ultimately so many and so varied uses will be found that the increased quantities produced will be taken. But the history of nearly every common metal has proved that the development of new channels of consumption takes a good deal of time. Manufacturers must obtain the conviction that the low prices are not the result of a temporary flooding of the market. They must feel that when they adopt the recently-cheapened metal for certain purposes, they make the necessary changes in methods and in plant with the assurance that the money so invested will not be suddenly lost by a reaction. The great industrial community must learn to forget that nickel was once a dear metal. They must learn to class it as one which is available for many purposes for which it was never before thought of. All this, we repeat, takes time.

Meanwhile manufacturers using nickel to any considerable extent will make their purchases for current use cautiously and will carry as little as possible of a stock of the metal whose near future is clouded with the prospects of a sharp decline.

The enormous strides which are being made in the development of the natural resources of this country are appreciated by very few. Statistics are published, it is true, and almost everybody pays some attention to them, but, after all, mere figures do not create much of an impression. This is especially true when figures grow large. For instance, the production of iron ore in the Lake Superior region this year, it is estimated, will exceed 7,000,000 tons This will be a huge output, but its real significance can only be gathered by connecting it with some other fact. Estimating the average quantity of this ore to make a ton of pig-iron at 1.7 tons, which is a very liberal allowance, the output of Lake Superior ore this year will be equal to the production of considerably over 4,000,000 gross tons of pig-iron, or more than the total production of pig-iron in this country in 1885. Thus this one ore district has increased its output so enormously that it is at present equal to the entire ore requirements of the country only four years since. This calculation does not take into consideration the use of mill-cinder, which is quite extensively mixed with Lake Superior ore in the production of foundry pig-iron, and would considerably decrease the average consumption of ore to the ton of pig, thus increasing the quantity of iron made.

Manufacturers Migrating Westward.

The determination of Rathbone, Sard & Co., of Albany, N. Y., to remove the principal portion of their extensive stove foundry to Aurora, Ill., which has recently been announced, excites much interest in Western business circles. Grange Sard, a leading member of the firm, said in an interview which was published in a Western journal in reference to this important step: "Our coming West is not a mere whim. It is significant of a movement which is bound to become more apparent every year. The outlet in the West for manufactured goods is growing to be enormous, and in all lines of manufacture where freights cut a large figure factories will be forced to come West. Establishments like watch factories, in which a pound of steel makes thousands of dollars' worth of goods, are not affected as coarser forms of manufacture are and may remain in the East, but others must necessarily drift westward."

The movement to the West is, however, not of recent origin. It has been in progress for years in other lines of business than the manufacture of stoves. Many Eastern concerns have long had branch establishments located at points in the West specially advantageous for their trade. It was foreseen by shrewd business men that the West would not long remain dependent upon Eastern factories for its supplies, but that Western enterprises would be started to meet local demands and that they would secure important advantages over their more distant competitors. This has actually been realized in more than one industry. There are to day in operation at Chicago, St. Louis and a number of other manufacturing centers which might be mentioned large establishments whose products have outgrown the local market and are being shipped to the East in direct competition with the products of factories located there. We allude especially to concerns wholly of Western origin which have started in a small way and have grown with the development of their section. They secure their raw materials as cheaply as they could in the East and are not obliged to pay a higher rate of wages.

The Interstate Commerce law is credited in some quarters with the recent migration of industries to the West. In a few instances this is probably an active influence, as special rates can no longer be secured through favoritism or the corruption of railroad officials. With all on an equal footing so far as freight rates are concerned, those most distant from the general market must suffer loss of trade unless they have compensating advantages to equalize cost. But the freight question is overshadowed in importance by the results flowing from the constant cheapening of the cost of manufacturing in the West. Not only are raw materials so cheap that the West is becoming independent of the East, but the labor question is no longer the serious matter that it was but a short time since. The population of the West has increased so rapidly of late years and skilled and unskilled workmen are now so numerous that the payment of a premium to induce workmen to operate Western factories is obsolete. With cheap raw materials, with no dearer labor and with their customers at their very doors instead of 500 to 1000 miles away, it is no wonder that Western manufacturers are taking the trade which at one time kept machinery in profitable motion along the Hudson, the Connecticut or the Merrimac.

The extraordinary development of the railroad systems of the Central West has also had much to do with the movement under consideration. In no other part of the country are there so many independent lines competing for business, and the natural result is that freight rates are moderate in every direction from what have grown to be the great centers of railroad traffic. The number of independent railroad lines running to Eastern cities and manufacturing centers is very small in comparison, and freight rates are maintained on a higher basis. In this respect the Central West bids fair to maintain permanently an advantage over the East.

OBITUARY.

W. W. EATON.

From an obituary notice published in the Chicago *Inter-Ocean* for October 3 we learn that on August 27 the Rev. W. W. Eaton, of that city, died at the age of 78 years. His name will be recalled as the editor of the Chicago *Journal of Commerce* for a number of years, his connection with the paper having terminated some time since. He was educated at the Maine Wesleyan Seminary; founded the first Christian or Disciples' Church in Canada, at St. John, N. B.; was professor of English literature in Bethany College, Va., from 1842 to 1844, then returned to the active work of the ministry and became interested in the conduct of religious periodicals; in 1861 became war correspondent of the Cincinnati *Gazette* and was afterward a chaplain in the army, and at the close of the war devoted himself to journalism, first at St. Louis and afterward at Chicago. His course as editor of the *Journal of Commerce* gained him a very wide circle of friends among the manufacturers, particulary of the Northwest, who will hear of his decease with regret.

English papers proclaim that agriculture, so long depressed in that country, is reviving. Farmers no longer grumble. Never before was there such an agricultural show in England as that which took place in Windsor a few weeks ago.

THE PARIS EXPOSITION.

Exhibits of French Iron-Makers.—III.

The Châtillon et Commentry Company, whose commercial work, as alluded to in the issue of *The Iron Age* of October 3, page 517, is one of the great French works which has given special attention to armor and projectiles. As early as 1865 the manufacture of iron armor-plates was begun, and since then the aggregate tonnage delivered to the French Government has been 20,000 tons. When in 1880 the Gâvres trials proved the progress made with Cammell compound plates and led to their adoption by the French Navy the Châtillon et Commentry Company were one of the three French concerns who acquired the right to the process of manufacture, the Saint-Chamond and the Rive-de-Gier works being the other two. Among the large plates exhibited an iron plate 0.5 m. thick, 4 m. long and 2 m. wide, weighing 34.6 tons, tested a Gâvres satisfactorily in 1886, and a compound plate for the Formidable weighing 32.19 tons. The company did not, however, adhere blindly to the compound plate, but seem to have gone to work intelligently on all-steel armor-plate. For those cases where glancing shots are likely to strike armor and where penetration is particularly dangerous the company have developed a soft and extra soft steel, and for other purposes a hard metal. For land fortifications the company have furnished 21 out of the 25 turrets thus far ordered by the French Government and 32 of the 62 recently required for Belgium.

The company claim to have developed in a special manner a close study of the physical changes brought about in heating steel by using currently an apparatus for measuring the extension of steel and for estimating the high temperatures of heated metal. Particular stress is, however, laid on .

TEMPERING IN LEAD.

The company have established a special plant for this purpose and have experimented exhaustively and intelligently on the subject. In a special report by M. Evrard, general manager, it appears that the size of the lead-bath has been increased until now it is capable of holding 250 tons of lead. The temperature is varied considerably according to the kind of steel operated on, and the depth and volume of the bath must be changed, which it seems is done by filling in parts of the space otherwise occupied by lead. From the report of M. Evrard and articles by E. Lisbonne in the *Génie Civil* we gather the following data:

Starting on hammered steel, shells made of steel carrying about 1 per cent. of carbon yielded the following results, test-bars being cut from the cold metal:

	Limit of elasticity. Kg.	Tensile strength. Kg.	Elongation. Per cent.
Tempered in lead:			
No. 1	50	81	9.5
No. 2	47	84	9 5
No. 3	48	91	7.75
Average	48.4	85.4	9
Tempered in oil:			
No. 1	47	83	6
No. 2	45	73	7.5
No. 3	44	73	6
No. 4	45.4	85.4	6.5
Average	45.4	76.4	6.5

Shop-tests were carried on on bars 30 x 30 cm. placed on supports 160 mm. apart, an 18 kg. trip-hammer being used. The distance of the fall was increased at each blow 10 cm., starting at a hight of 50 cm. In the case of the steel tempered in lead, rupture resulted at a hight of 2.80 m. in the two first cases and 2.40 m. in the second, while in the case of shells tempered in oil the figures were 2.10 m., 2.20 m., 1.90 m. and 2.07 m.

On gun-tubes which were made at the works from soft steel the process does not seem to give a notably better result than that used in ordinary manufacture. It simply has the advantage of doing away with reheating.

The first experiments made by the Commentry Company on armor was on parts from two plates carrying 0.54 to 0.64 of carbon. In the case of the former the resistance from rupture rose from 6.2 kg. to 7.6 kg., and the elongation, which was 15.5 per cent., dropped to 9.5 per cent. In the case of the steel containing 0.64 carbon, the resistance rose from 77.3 kg. to 89 kg., and the elongation, which was 10.5 per cent. before tempering, was 13 per cent. after it. On compound plates the steel of which carried 0.73 carbon, the plate merely reheated showed an elastic limit of 39 kg., a tensile strength of 80 kg. and an elongation of 10 per cent. When tempered in lead the elastic limit rose to 58 kg., the tensile strength to 95 kg. and the elongation to 12 per cent. On soft steel-plates two specimens carrying 0.30 carbon showed the following: The limit of elasticity was increased from 25.7 kg. to 28 kg., the tensile strength from 5L4 kg. to 53 kg., while the elongation was reduced from 25 per cent. to 23 per cent. M. Evrard states that in all soft steels which have been rolled there is very little increase of resistance from the tempering by lead. The most notable result is an increase of the balistic resistance, as was proved by our trials with guns which we will mention further on. He claims, however, that on soft steels merely cast immersion in metallic baths has a most marked effect. The grain is as completely changed as if it were done by forging, and resistance to shock is increased to a notable degree. Our balistic experience on merely cast and tempered plates give about the same results as those on rolled plates. He urges that herein lies one of the most important applications of the process to the manufacture of armor-plates, and besides to all kinds of cast-metal, on account of the increase or resistance due to the use of this method of tempering.

COMPARATIVE TARGET-PRACTICE TESTS ON PLATES TREATED OR NOT BY THE PROCESS.

The first experiments of the target practice at the Saint-Jacques Works were all made under identical conditions so as to facilitate comparison.

The plates tested measured 1.500 x 0.735 and 0.726 m. The cannon used was of 95 mm. caliber, firing at a speed of 416 m. cylindrical projectile, with blunt cone point of chilled iron or chrome steel, weighing 11.4 kg. The shots were fired at the four corners of a lozenge-shaped plate, whose sides were twice the length of the caliber—*i. e.*, 19 cm. After the first four shots the remaining shots were fired on the same four spots in the order of the first firing.

The results of these experiments were as follows: An iron plate which was tested as a sample gave a mean depression for the first four shots of 132 mm. and for the following shots of 198. It was cracked by the seventh shot and completely broken in two by the eighth shot. A hard steel plate tempered in lead showed a mean depression of 99 mm., while a non-tempered steel plate showed 105 mm. The number of shots before rupture was six for the first and only five for the second, but this result for the tempered plate must be attributed to a lateral flaw which occasioned a premature crack, otherwise it would undoubtedly have stood eight or more shots. Two rolled plates of soft metal showed about the same depression (111 mm. and 112 mm.); only the first was able to withstand one more shot. It was broken by the seventh shot and the second by the sixth. A plate of simple cast-steel tempered in lead gave the same results as the rolled and tempered plate. It withstood seven shots, with a depression of 113 mm. A cast and non-tempered plate, tested for comparison, broke at the fifth shot with 119 mm. depression. Two compound plates, tempered and not tempered, presented about the same results as to depression (89 mm. and 83 mm.); the tempered plate stood ten shots and the trial was only stopped by the crumbling of the outer layer of the plate, which was badly welded. The plate not tempered, made of extra-hard steel, broke at the third shot.

The first trials prove very forcibly the influence of the process on the manufacture of armor-plates, especially those of hard steel; resistance to penetration and stiffness are increased without any resulting brittleness in the metal. With pieces in soft metal merely cast we are able to obtain a resistance equal to that of forged pieces.

The company have tried to determine the influence of the process of immersion on metal, independent of their ultimate use. For the tests bars were cast into uniform shapes 120 x 120, which were then rolled into blunt cones 40 x 40. Each metal bar thus used was tempered in a lead-bath at about 400° C., the bath being composed of about ten times the weight of the bar immersed. The temperature of the bars varied according to the nature of the steel, but efforts were made to keep it a little above the point B of the Tchernoff classification. The other part of the bar was reheated in the ordinary manner—*i. e.*, two hours red-hot, then cooled in dry sand. Next the bars which had served for the tensile strength and shock tests were cut from the cold metal. These tests were applied under the ordinary rules governing the artillery service, and were made on five different kinds of steel—carbon, silicon, manganese, chrome and cement steel. These experiments established the following facts:

1. *Carbon Steel.*—Even for this class there is quite an increase of the limit of elasticity. This increase goes as far as 30 per cent. For the harder metals it is generally less and is about 20 or 25 per cent. except for the carbon and manganese steels, where it attains 40 per cent. In the soft steel the diminution of elongation is imperceptible. In metals having from 0.45 carbon there is a mean result of 38 per cent. elongation before tempering, varying from 10 to 50 per cent. In the shock test there is an increase of stiffness in the metal according to its hardness. The brittleness after tempering is less, while the tempered bars withstand more shots than those not tempered.

2. *Silicon Steel.*—Only a few tests have been made with this class of metal. The limit of elasticity, however, after tempering, shows an increase of 17 to 32 per cent. The increased tensile strength is about 16 per cent. The diminution in the ductility is 30 per cent.

3. *Manganese Steel.*—The increase of the limit of elasticity after tempering varies from 12 to 17 per cent. The increase in resistance is from 16 to 23 per cent. The diminution of elongation attains 53 per cent.

In the manganese as in the silicon steel the tempering by lead increases its stiffness in the shock tests. The number of hammer strokes withstood is about the same for the tempered as for the metal not tempered.

4. *Chrome Steel.*—In this class of metal the bars tempered were reheated to a dull red. For the most part it was impossible to get at the limit of elasticity after tempering, but it seemed to increase from 10 to 18 per cent. The tensile strength presents a relatively small increase as compared with the preceding metals. This fact is explained by the reheating after the tempering. This increase varies

from 10 to 22 per cent. for widely differing classes of the metal. As for the diminution of elongation, it is less than for the foregoing metals. It is about 21 per cent. In the shock test a noticeable increase of stiffness was observed. The steel after tempering is less brittle and withstands before rupture a greater number of hammer blows.

5. *Cement Steel.*—The increase of the limit of elasticity by tempering is 21 per cent. The increase of resistance is about 17 per cent. The diminution of elongation is 20 per cent. less for steel carrying less than 1 per cent. carbon. In the shock test there is quite a notable increase of stiffness, while the metal does not seem to be more brittle after than before tempering.

It is claimed that the fact was proved that even for the harder steels (providing they were perfect at the start) there was no fear of flaws caused by the process of tempering. A chilled cast-iron shell, with 3.50 carbon, which would not have stood the ordinary tempering with oil or water without cracking, came out of the immersion in lead perfect.

Experiments on steel tires are claimed to have proved the advantages of tempering with lead. By submerging steel tires which had been refused by the principal railroads in the lead-bath it was possible (when they were perfect at the start) to put them in condition to fill all requirements of contract. As an example tests applied to a lot of steel tires for the Lyons and the Orleans railroads are quoted.

Comparative tests were made on 15 tempered and 15 tires not tempered. The test applied was the fall of a 1000 kg. hammer from a hight of 10 m. on each tire placed horizontally. These tests gave the following results:

	Tires not tempered.	Tempered tires.
Rupture....	3.6 blows (mean)	4.5 blows (mean)
Depression caused by first blow	98 mm.	74.6 mm.

It is claimed that this shows that the tempering increases the stiffness of the metal and its resistance to rupture. The tires thus treated were in condition to be accepted by the railroad company.

M. Evrard sums up the results as follows: "By the lead-tempering process under conditions indicated above a mean increase of 20 per cent. in the limit of elasticity may be counted upon, also an increase of 18 per cent. in the tensile strength. These increases are more pronounced in the carbon steels than in any other. The minimum of increase was found in the silicon-steel series. The diminution of elongation was greatest in steel high in manganese; it was the least perceptible in the chrome steel. As regards the shock test, the stiffness is increased without rendering the metal more brittle. It is from these data that each works must determine for itself the article or articles it manufactures which are most liable to gain by the application of this process of immersion in metallic baths."

A somewhat mysterious allusion is made to a further series of tests shrouded in the sanctity of private interests.

In an article on rapid transit plans in *The Iron Age* of September 12 we stated that in the system employing a track of rollers the latter were arranged to move along inclined ways. These ways or girders are not rigidly fixed at a slight incline to cause the rollers to descend to the lower end or first position after the passage of the car, but are slightly movable at their forward ends. The inventor of this system, A. D. Gates, of Cleveland, Ohio, states that the rollers move forward when caused to do so by the passage of the platform from which the car proper is hung, and after the car has passed the girder is raised at the forward end by a spring, the inclination given the girder being only sufficient to cause the roller to return to its position of rest in readiness for the next car. It is evident that this method of propelling the car on rollers reduces the friction to a minimum.

A Shop Mail Service.

During a recent visit to the works of the Yale & Towne Mfg. Company, at Stamford., Conn., we had occasion to note an interesting system of intercommunication between the departments of that large establishment which probably many manufacturers may find it convenient and profitable to employ, possibly in a modified form to suit local conditions. It consists practically of a shop letter-carrier system, one or more boys going the rounds of the works in a specified schedule time all day, in the case of the Yale & Towne Mfg. Company at intervals of half an hour. Every head of a department, foreman and clerk who should be in communication with the principal officers or others is provided with envelopes and blanks which we reproduce:

SHOP MAIL. | THE YALE & TOWNE MFG. COMPANY.

Check Address to which Envelope is to be Delivered.

Envelopes left unsealed may be used again by canceling Orginal Check-Marks.

	President.		Dept. C. (Cranes).		Rim-Locks.
	General manager.		Dept. D.(Pulley Bl'cks).		Mortise-Locks.
	Treasurer.		Dept. E. (Post-Offie).		Job Work.
	Paymaster.		Dept. L. (Smith Shop).		Yale Cabinet Locks.
	Sales Clerk.	×	Dept. M. (Iron Fo'ndry)		Escutcheon Job.
	Mr. P. (Correspond'nce)		Dept. N. (Brass F'ndry)		St'n'd Cabinet Locks.
	Mr. U. (Printing).		Wood-Pattern Shop.		Padlocks.
	Mr. A. (Power & Plant)		Metal-Pattern Shop.		Bronze Goods.
	Mr. M. (Design'g Eg'r).		Pattern-Vault.		Butt Job.
	Mr. W.		Tool-Room, Dept. A.		P. O. Metal-Work.
	Mr. J. (Lock Drawings).		Smithery.		Plating Department.
	Mr. K. (Art Work).		Bower-Barff.		Inspecting-Room.
	Mr B. (Chemist).		Modelers.		Shipping-Room.
	Supt. Dept. A.		Chasers.		Photograper.
	Asst. Supt. Dept. A.		Press-Room.		Supply Store.
	Supt. Dept. B.		Wheel-Room		Gate-Keeper.

It will be observed that the envelopes bear the names of the different departments and employees, and that a check-mark is simply placed along the proper address, say Department M, to reach the person to whom it has been forwarded. Larger envelopes are provided for documents, &c., which may be sent from one officer to the other. The blank reproduced is used for the numerous communications which pass daily between different departments concerning current and routine business.

The advantages of such a system will be readily appreciated. There is none of the hunting about the works for this or that person, with the waste of time which it implies. None of the errors are possible which grow out of the misunderstanding of verbal orders, and those in general charge of the operations need not burden their memory with orders once given, so that they may finally assure themselves that they have been carried out. The notes in themselves are records which are the best evidence of orders given and of the time and manner of execution. The executive officers are relieved, too, of the waste of time which the tendency of some employees to argue and their inability to express themselves promptly and concisely brings with it.

Of course the shop-mail system does not supersede entirely the telephone or speaking-tubes in a large establishment, nor does it obviate the necessity or curtail the utility of conferences on important matters. It does not destroy the influence which the personality of those managing a concern have upon the men who are their subordinates, but it does save them a good deal of time frittered away in talking over unimportant matters.

THE YALE & TOWNE MFG. COMPANY.

Avoid Verbal Inquiries. If a matter of correspondence, transcribe original or attach hereto.	**SHOP MAIL.**	Return by Shop Mail. Use no Envelope except for confidential matters.

Issued _____ *M* _____ *18* *Returned* _____ *M* _____ *18*

To Mr. _____ *From Mr.* _____

Relating to Order _____

Note _____

Reply _____

As indicative of the uniform work done in making low-carbon steel at the Troy Steel and Iron Company, Troy, we may note that out of 65 conversions lately made consecutively only six showed 0.10 carbon, all the other 59 ranging between 0.07 and 0.09 carbon. A recent test of special stock of 0.13 carbon, on a half square showed an elastic limit of 50,290 pounds, tensile strength of 68,115 pounds and an elongation of 20.6 per cent., the test piece being 8 inches long.

The official report of the trial board on the new cruiser Baltimore shows that the vessel fell 22.12 horse-power short of the required 9000. The Cramps will be allowed another trial, if they desire, at their own expense; otherwise the cruiser will be accepted anyhow.

The Blast-Furnaces on October 1.

As has been generally expected, the capacity of the blast-furnaces now at work has been considerably increased during September, the aggregate weekly make of the anthracite and coke furnaces having reached 139,010 tons on October 1, as compared with 132,941 gross tons on September 1. The make would be even a little larger were it not for the fact that there is considerably scarcity of cars, notably west of the Allegheny Mountains and north of the Ohio River. The result is that in some of the leading districts the furnaces cannot be driven to their fullest capacity. The indications point to a further growth in the product, although it is practically impossible in such districts as the Lebanon, Shenango and Mahoning valleys and the Pittsburgh and Chicago districts. Alabama is steadily increasing its make, as one by one the furnaces built during the past year or two are swinging into line.

In detail the position of the anthracite furnaces is as follows:

Anthracite Furnaces October 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	23	11	3,772	12	3,841
New Jersey	14	4	1,825	10	3,604
Spiegel	3	2	118	1	100
Pennsylvania:					
Lehigh Valley	46	26	9,974	20	6,630
Spiegel	1	1	75	0	0
Schuylkill Valley	32	15	5,090	17	4,430
U. Susquehanna Valley	17	8	3,122	9	1,150
Lebanon Valley	16	15	7,245	1	208
L. Susquehanna Valley	21	12	5,337	9	2,210
Totals	173	94	36,558	79	22,173

For the past 13 months our records show the following:

	Furnaces in blast.	Capacity per week.
October 1	94	36,558
September 1	93	35,997
August 1	88	34,277
July 1	89	34,142
June 1	91	34,386
May 1	95	35,315
April 1	102	37,977
March 1	103	37,937
February 1	107	39,187
January 1, 1889	107	38,726
December 1, 1888	99	34,879
November 1	95	33,645
October 1	95	33,728

From New York or New Jersey no changes are reported as having occurred during September. In the Lehigh Valley the Allentown Rolling Mill Company have blown in their second furnace and Durham was running during the greater part of the month. In the Schuylkill Valley Anvil and Swede are repairing. Warwick has resumed since the 1st inst., and Phœnix No. 2 is to go in during the present month. In the Upper Susquehanna Valley Bloom has stopped for repairs. In the Lower Susquehanna Valley Conestoga and one Paxton went to work on the 3d ult. The Lebanon Valley keeps up its wonderful record of activity.

As compared with the 12 previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
October 1	154	102,452
September 1	141	96,744
August 1	137	99,720
July 1	136	96,548
June 1	135	91,771
May 1	147	98,309
April 1	151	100,060
March 1	150	100,757
February 1	150	98,518
January 1, 1889	157	106,736
December 1, 1888	151	101,748
November 1	146	94,695
October 1	137	85,461

Coke Furnaces October 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York	4	2	1,733	2	2,200
Pennsylvania:					
Pittsburgh district	20	20	22,358	0	0
Spiegel	1	1	702	0	0
Shenango Valley	19	16	10,677	3	1,745
Juniata and Conemaugh valleys	17	11	4,094	6	2,410
Spiegel	1	0	0	1	600
Youghi. Valley	5	4	1,528	1	730
Miscellaneous	4	3	1,920	1	590
Maryland	1	1	179	0	0
West Virginia	6	2	1,463	4	1,488
Ohio:					
Mahoning Valley	14	12	8,685	2	1,575
Central and Northern	19	14	9,506	5	3,490
Hocking Valley	14	4	1,309	10	3,210
Hanging Rock	13	7	1,460	6	970
Indiana	2	0	0	2	389
Illinois	12	10	10,254	2	1,800
Spiegel	1	1	600	0	0
Wisconsin	4	2	1,242	2	1,160
Missouri	6	2	890	4	2,218
Colorado	2	0	0	2	940
The South:					
Virginia	12	9	4,677	3	1,250
Kentucky	4	2	502	2	510
Alabama	26	23	14,332	3	1,450
Tennessee	11	7	3,532	4	2,280
Georgia	2	1	609	1	310
Totals	220	154	102,452	66	30,315

In New York Troy has made a very good record, in spite of a temporary stoppage, due to scarcity of coke created by the Walston strike. The Pittsburgh district, it will be observed, was running to full capacity on the 1st inst, and four new furnaces now under construction are being pushed rapidly along. The Shenango Valley is doing its utmost, considering the difficulty experienced in obtaining regular car service. In the Juniata and Conemaugh valley districts the furnaces of the Cambria Iron Company had a light product in September, on account of the strike at the coke ovens. They are now again running full. The second Rockhill Furnace is now running. There have been no changes of consequence in the Youghiogheny Valley or West Virginia.

In Ohio the Mahoning Valley is producing close to its maximum capacity. Hubbard, Himrod and Mary were added to the list of producers in September, but, on the other hand, Tod blew out for repairs. It had been in blast 34 months, making in that time 149,000 tons of metal. Here, too, the car scarcity is troublesome. In central and northern Ohio the two Seneca furnaces are now at work. In the Hocking Valley both Fannie furnaces have now stopped making iron. In Illinois two more of the Union furnaces of the Illinois Steel Company have been blown in, while in Wisconsin the same company are now running the Mayville.

In Virginia there were no additions to current capacity in September, but since the opening of the present month, on the 3d, Gem was lighted. Alabama is rapidly increasing her product, a number of new furnaces now being at work In addition thereto, the second Eureka and the second Woodward resumed, both having completed repairs. On the other hand, one of the Alice furnaces blew out. In Tennessee there were no changes. We understand, however, that Citico has again blown in. Our returns are not yet sufficiently complete to report the status of charcoal furnaces.

The official figures of French trade for the first eight months of the year show to how large an extent the international movement of specie is independent of the simple balance of merchandise traffic. Up to the close of August the French imports of gold are officially reported as 257,901,808 francs, against 60,553,741 francs exported. This leaves an import balance of 197,348,067 francs, from which it would naturally be assumed that there must have been in those months a considerable excess of merchandise exports. Yet it appears that 2,765,000,000 francs' worth of merchandise were imported, against 2,267,000,000 francs' worth of exports. That is to say, the local trade balance, exclusive of silver, was 695,348,000 on the side of the imports. This apparent discrepancy cannot be accounted for by the trade debt of past years.

PERSONAL.

L. G. Laureau, metallurgical engineer, has removed from Philadelphia to New York, his present address being 60 Washington square, south.

Isaac Block, of Chicago, member of the firm of Block, Pollak & Co., of Cincinnati and Chicago, returned from Europe on the 24th ult., after an absence of three months for the benefit of his health.

Samuel Hartranft, son of ex-Governor Hartranft, of Pennsylvania, has recently been appointed manager at the Sheridan furnaces.

Levi A. Yocum, who has had charge of the Norway Furnace at Bechtelsville, Berks County, Pa., for a number of years, has resigned his position to take charge of the furnace plant of the Reading Iron Company, at Reading, Pa. His son Howard will act as his assistant.

William Floyd has been appointed foreman at the Wheeling Steel Works, Wheeling, W. Va., to succeed Charles McDonald, resigned.

On the 1st inst. Grant Wilkins, chief engineer of the Atlanta (Ga.) Bridge and Axle Works, resigned his position. Mr. Wilkins had been chief engineer of these works since their organization.

F. E. Bachman has been appointed manager of the Salem Furnace Company, Salem, Va., who have let the contracts for the erection of a furnace at that point.

N. S. Chamberlain and R. M. Shook will soon go abroad to study some of the methods of manufacturing steel in England and on the Continent.

R. W. Raymond has gone to Great Falls, M. T., for a stay which may extend till the beginning of November.

The attempted substitution of cotton bagging for jute, which has so long agitated the Southern commercial exchanges, is a failure, at least for the present season. The opposition of Liverpool was too powerful to be resisted in the absence of united effort in the home market. The New Orleans Cotton Exchange rescinded the action taken by them recently in the bagging convention, and the Savannah Cotton Exchange recommend that no change in the manner of dealing in cotton be made until a standard for cotton bagging can be agreed upon. This leaves a number of manufacturers of bagging who have adapted their machinery to new processes in an uncomfortable position, and the Farmers' Alliance formed at Augusta, Ga., who threw themselves into antagonism with the Jute Trust, are severely disgruntled. An unexpected outcome of the whole movement is a consolidation of all the bagging interests of the United States under the name of the American Mfg. Company, of New York. Warren, Jones & Gratz, of St. Louis, who are head of the Jute Bagging Trust, are the prime movers in the new organization.

An extensive warehouse will be built at Jacksonville, Fla., preliminary to making that port a cotton mart.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 7, 1889.

A mild state of excitement has prevailed in this market, occasioned by reports of advances at important producing centers of raw products, as well as of more finished articles. Further advances are deprecated on all sides, as it is believed that higher rates than those now established will lead to an unhealthy state of trade, encouraging speculation and stimualting production unreasonably.

Pig-Iron.—Prices continue to harden A strong demand exists for Coke Iron. During the past week a considerable quantity of Bessemer Pig-Iron has been bought by Pittsburgh parties, and although none of it came from this section the influence of the purchases is felt here. Coupled with these heavy purchases the rumor has gained currency that large Western consumers are also in the market for round blocks, but there is every reason to believe this is not the case. While it is known that some of the Western consumers of Bessemer Pig-Iron have been short in their supply, because of more or less trouble with their own furnaces, this difficulty has been overcome by the better work of the furnaces and they are not now in the market as buyers. Should the Springfield Iron Company conclude to start their Steel plant soon they will need a supply of Bessemer Pig. It is now quoted here at $18.50 @ $19, but it could not be delivered here at such prices from Ohio furnaces. It is now very hard to buy Lake Superior Charcoal below $19.50, cash, and an early advance to $20 is looked for. Manufacturers have in the past week refused to make quotations who have heretofore been willing to sell at current rates. Quotations are as follows for cash, f.o.b. Chicago: Lake Superior Charcoal, $19 @ $19.50; Local Coke, No. 1, $17 @ $18; No. 2, $16.50 @ $17; No. 3, $16; Chicago and Bay View Scotch, No. 1, $17 @ $18; Bessemer, $18.50 @ $19; American Scotch (Blackband), No. 1, $19.50 @ $20; Jackson County, No. 1, $18; Hocking Valley Soft, No. 1, $18; Southern Coke, No. 1, $16.75 @ $17; No. 2, $16.25 @ $16.50; No. 3, $15.50 @ $15.75; No. 1, Soft, $16.25 @ $16.50; No. 2, Soft, $15.25 @ $15.50; Gray Forge, $15.25 @ $15.50; Mottled, $14.50 @ $15; Tennessee Charcoal, No. 1, $18.50 @ $19; Alabama Car-Wheel, $23 @ $24.

Bar-Iron.—A great deal of new business is coming forward, and prices are very firm at 1.70¢ at mill or 1.80¢ @ 1.85¢ f.o.b. Chicago for carload lots of Common, and 1.85¢ at mill or 2¢ Chicago for single Refined. Orders for 4000 to 5000 cars are in the market, and Car-Iron is higher, mills asking 1.85¢ @ 1.95¢, Chicago. Jones & Laughlins have advanced their price from store to 2.10¢ regular, with full Western extras, for Common Iron, and other jobbers are falling in line. Probably 2¢ is the bottom price now from any Chicago store to even the best trade. Heavy Hardware jobbers have a meeting to-day, at which prices on Iron and Steel will probably be marked up.

Structural Iron.—The event of the week was the advance of $\frac{1}{10}$¢ ₱ lb on Beams and Channels, which was made on the 4th inst. Western prices are now as follows: Chicago and Milwaukee, 3.20¢; Wisconsin, except Milwaukee, and towns on Mississippi not north of Iowa, 3.25¢; towns on Mississippi north of Iowa, 3.30¢; towns in Missouri off of the Mississippi River and on the Missouri River not above Sioux City, 3.50¢. Tees have also been marked up. Local Architectural Iron manufacturers have been slightly shaken up and not a little amused by their defeat in competing for a local contract by a St. Louis firm. Prices for mill lots of shapes are as follows, f.o.b. Chicago: Angles, 2.25¢ @ 2.35¢; Universal Plates, 2.40¢; Sheared Plates, 2.45¢ @ 2.50¢; Tees, 2.75¢ @ 2.85¢; Beams and Channels, 3.20¢. Small lots from store are quoted at 2.40¢ @ 2.50¢ for Angles, 2.80¢ @ 3¢ for Tees and 3.70¢ for Beams and Channels.

Plates, Tubes, &c.—Numerous deals have been closed which had been pending for some time, and which caused the week's business to run up well Plenty of work is still in sight, but not so much as there has been. The Plate mills are reported very full of orders, many refusing to quote on deliveries before January 1. From store the following quotations are made: Iron Sheets, Nos. 10 to 14, 2.80¢; Steel do., 2.90¢ @ 3¢; Tank Iron, 2.70¢; Tank Steel, 2.75¢ @ 2.85¢; Shell Steel, 3¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢. In carload lots manufacturers make the following prices f.o.b. Chicago: Nos. 10 to 14 Iron Sheets, 2.65¢; Nos. 10 to 14 Steel Sheets, 2.75¢; Tank Iron, 2.55¢; Tank Steel, 2.60¢. On Boiler-Tubes 50 % off is asked for 1¼-inch and less and 55 % off for 2-inch and upward.

Sheet-Iron.—Jobbers are now enjoying a very active trade, in consequence of the approach of colder weather. They quote 3.50¢ for small lots of No. 27. It is usual at this time of the year to find the mills soliciting orders for December and January delivery, but this year is a decided exception, and it is now difficult to find a mill prepared to quote. W. D. Wood Company have advanced their price on Smooth Finished Iron $\frac{1}{10}$¢ ₱ lb.

Galvanized-Iron.—Jobbers have advanced their price on Juniata to 65 % off as bottom, and are having a good demand. Manufacturers' agents report considerable trouble in filling orders for standard sizes, their stocks running down faster than receipts come in from the mills.

Merchant Steel.—Prices now quoted are very firmly held, some mills asking even higher rates, having all the work they care to take for the present. Large buyers are in the market, and very heavy trade could be done if manufacturers were in a position to handle it. Another advance in Soft Steels is looked for. Makers quote carload lots as follows, f.o.b. Chicago: Spring Steel, 2.40¢ @ 2.50¢; Tire Steel, 2.30¢; Toe Calk, 2.40¢ @ 2.50¢; Open-Hearth Machinery, 2.25¢ @ 2.40¢; Bessemer Machinery, 2.15¢ @ 2.20¢; Solid Cast Plow Steel, 3.25¢; Open-Hearth Plow Steel, 2.75¢. From store jobbers quote: Mild Machinery, 2 30¢ @ 2.50¢; Bessemer Machinery, 2.40¢ @ 2.60¢; Open-Hearth Machinery, 2.70¢ @ 3¢; Tire, 2.40¢ @ 2.50¢; Tool, 7.50¢ @ 8.50¢; Sheet, 7¢ @ 10¢.

Steel Rails.—Nothing of special importance has occurred in this line, save the placing of some orders for next year's delivery, which has been done to a limited extent, manufacturers being inclined to proceed very cautiously in anticipating the future. They have been solicited to take much more business of the same kind. Quotations are maintained at $33 for standard sections and $36 for 35s and 40s. In the present condition of the Rail trade higher prices could easily be fixed, but the manufacturers are disposed to keep prices down as much as possible, believing that it would be unwise to advance them much beyond the rates now ruling. An outside mill was offered $34 for a small lot of standard Rails for delivery in November, which had to be refused on account of the inability of the mill to take any more work.

Track Supplies.—Inquiries are numerous, and a good volume of business is in progress, with advancing prices. Quotations are as follows, f.o.b. Chicago: Steel Splice-Bars, 2¢ @ 2.05¢; Iron ditto, 1.90¢ @ 1.95¢; Spikes, 2¢ @ 2.10¢; Bolts, Square Nuts, 2.65¢ @ 2.70¢; Hexagon, Nuts, 2.75¢ @ 2.80¢.

Old Rails and Wheels.—A limited quantity of Iron Rails has been sold at $24.75, but business is checked for the time by the elevated ideas of holders, who ask $25 as a minimum, which consumers are not prepared to pay. At the same time a speculative interest is developing which may absorb the supply now available and force an advance. For short pieces Steel Rails $17 is asked, with long lengths selling at $18 @ $18.50. Car-Wheels are quiet, holders being disinclined to part with them at $18.50, which is offered by consumers. A nominal quotation is $19.

Scrap.—The demand is growing and the market is widening. Cast-Iron now moving as well as Wrought. Prices are advancing. Dealers' quotations are as follows, per ton of 2000 lb: No. 1 Forge or Railroad Shop, $20 @ $20.50; No. 1 Mill, $15 @ $15.50; No. 2 Mill, $10 @ $11; Car-Axles, $24 @ $24.50; Horseshoes, $18; Wrought Pipe, $14; Cast Machinery, $13; Stove-Plates, $10; Cast Borings, $8.75; Wrought Turnings $12 @ $12.50; Axle Turnings, $13 @ $13.50; Locomotive Tires, $17; Leaf Steel, $16; Coil Steel, $16; Mixed Steel, $12; Mixed Country Scrap, $15.

Hardware.—Jobbers report a heavy trade in progress, with bills well distributed over their entire stock. Wire is advancing, manufacturers having issued circulars withdrawing all quotations. A pronounced advance has been made abroad on Tin-Plates and Terne-Plates, and jobbers here are not able to duplicate orders at less than 37½¢ @ 50¢ ₱ box advance. A leading house here had an order cut down from 1000 boxes to 500 boxes in consequence of the inability of its foreign correspondents to fill it. Machine Belts have been advanced by the manufacturers to 80 % off for ½ inch and larger and 80 % and 10 % off for $\frac{7}{16}$ inch and smaller; Lag-Screws, 80 % and 5 % off. These quotations are the best prices now made.

Nails.—Makers now ask $2.10 @ $2.15 for Steel Nails at factory, and but a limited number of them are in the market, others being sold ahead as far as they deem it safe to go. The advance has checked business, buyers being incredulous that it can be sustained. Jobbers are asking $2.20 @ $2.25 for small lots from store and $2.15 for carloads. The price of small lots of Wire Nails is firm at $2.50, with 5¢ off for carloads. Jobbers' prices on Wire Nails are disproportionately low, as manufacturers now quote $2.35 @ $2.40 at factory, some of them refusing to sell carload lots at less than $2.50 at factory. Heavy buyers are in the market for Wire Nails, which appear to be getting scarce. A movement is on foot among the Rod mills and Wire mills which if consummated will cause a material advance in Wire Nails.

Barb-Wire.—Carload orders are occasionally received, but there is no speculative demand. Small orders are reasonably numerous. Dealers are not very anxious to sell at present rates, as they believe prices will be much higher shortly. Wire Rods are scarce and dear, and this alone will cause the price of the finished article to appreciate, even if the combination now being formed by the manufacturers should fail to be consummated. Small lots of Painted are

quoted at 3¢, with 10¢ ₱ 100 lb off for carloads and 60¢ ₱ 100 lb advance for Galvanized.

Pig-Lead.—Sales in this locality footed up less than 300 tons in the past week. The market was steady at 3.80c.

The Minerva Furnace, at Milwaukee, for which Forsyth, Hyde & Co., of Chicago, are sole agents, will be blown in about the 20th inst., on Foundry Pig-Iron. Orders have already been booked covering a large part of the capacity of this furnace for months.

D. C. Templeton, of Chicago, who was commissioner of the Northwestern Plow Association during its entire existence, proposes to establish a manufacturers' agency, to be devoted to such lines of trade as are closely connected with manufacturers of agricultural implements. Having been commercially identified with this class of manufacturers for many years, he enjoys a very extensive and favorable acquaintance among them, also possessing valuable relations with railroad interests. He is open for a representation in some of the metals and metal products.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, Pa., October 8, 1889.

Pig-Iron.—The market has maintained a strong tone during the week, and, while prices are nominally unchanged, the turn is in sellers' favor. The supply of Iron is large enough to meet current requirements, but orders for forward delivery are hard to place. Nearly all the leading brands are sold up, or, as the representative of a prominent company puts it, "we are not quoting on new business." In other words, their regular customers are supplied and outside business is not sought for. This practically represents the condition of nearly all the leading companies, so that as a matter of fact there is not a great deal of new business doing, except in small lots or to clean up odds and ends. All sorts of opinions are expressed in regard to the position, and while no one feels absolutely safe in making predictions the general belief is that prices are going higher. In support of this theory attention is directed to the heavy advance in the West, the scarcity of stock in all parts of the country and the remarkable movement in foreign markets. On the other hand, it is said that so many furnaces are getting ready to "blow in" that in a little while the supply will be greater than the demand. This is answered by the statement that Ores are likely to be very scarce, that fuel and other items of cost are advancing and that new furnaces cannot be operated to make any money unless selling prices are higher than those now ruling. But, after all, the main thing is in regard to consumption. The indications all point to unusually heavy requirements during the fall and winter months. Recent developments tend to confirm and strengthen this opinion, and while a set-back is not impossible, it certainly seems far from being probable. Under these circumstances makers of Pig-Iron are doing what they can to postpone naming prices on deliveries later than November or December. There would be no difficulty in entering contracts for large lots at current rates and it is not unlikely that orders for limited quantities may be taken, but most of the companies seem inclined to reserve some portion of their output for further consideration. Prices are already somewhat irregular; some ask slight advances, others quote same as last week, while the very low priced lots are either withdrawn or have been taken up. The lowest prices at which sales have been made during the week are reported at $15 for Gray Forge, $16 for No. 2 and $17.25 for No. 1. The lowest prices to-day as given by sellers are $15.25, $16.50 and $17.50, while good to favorite brands are readily taken, and range all the way from $15.50 to $16 for Gray Forge, $17 for No. 2 and $18 @ $18.50 for No. 1. Southern Irons are not offered here at present, although it is said that bids of $15 for Gray Forge and $16.25 for No. 2 have been made for 1000-ton lots without leading to business.

Ferromanganese.—Sales of 80 % were made a week ago at $87, Philadelphia, but the demand has fallen off, and there are no bids at anything near that figure. Spiegel is offered at $33, c i.f., duty paid, for 20 %.

Blooms.—Quotations on Steel Blooms are hard to get, as most of the mills have their order-books amply covered. A few sales have been made at about the prices quoted below, and for any one that can make deliveries the same figures would probably be accepted to-day, viz.: $34 @ $35, delivered, for Nail Slabs; $34 @ $35 for Sheet or Tank; $37.50 @ $39 for Shell; $40 @ $42 for Flange, and $42 @ $43 for Fire-Box; Charcoal Blooms, $52 @ $54; Runout Anthracite, $42.50 @ $43.50; Scrap Blooms, $32.50 @ $33.50 ₱ "Bloom" ton of 2464 lb

Muck-Bars.—The market is quiet, although prices are well maintained. A few sales have been made during the week at prices varying from $29, at mill, to $30, delivered, which are still firm quotations. The mills are turning out a much larger product than during the hot weather, but the offerings are not in excess of the demand, so that prices remain very firm.

Bar-Iron.—The demand is fair, but at last week's prices there has been no difficulty in placing orders. A few mills have been on the lookout for business, and have secured enough to keep them employed without cutting prices. There is a wide discrepancy in quotations, however, and it intimated that there is just as much difference in quality, although some of the parties may not admit it. In any case, sales are reported at prices varying all the way from 1.80¢ to 1.95¢, with 1.85¢ to 1.90¢ as a fair average for Bars that are considered strictly first class. The general position is considered satisfactory, as the leading mills have about all they can do to the end of the year, while the current demand promises to fill up all other vacant spots.

Skelp Iron.—There is some inquiry from large consumers, but they are evidently in no great hurry to place their orders. Bids of 1.80¢ @ 1.82½¢ have been made for Grooved, and 2.10¢ @ 2.15¢ for Sheared, but manufacturers ask about ⅛¢ more, and seem to be pretty firm in their ideas.

Plates.—This department is in a very strong position, with more business offered than can be well taken care of. Mills are all full of work for the next five or six weeks, some to the end of the year, while fresh inquiries are coming in daily. Prices are firm, especially on Steel, and might be advanced a little, but there is more difficulty in handling the business than in coming to an agreement as to prices, which in most cases are quoted about as follows, say: 2.20¢ @ 2.25¢, delivered, for Ordinary Plates and Tank Plates; 2.25¢ @ 2.30¢ for Universal Plates; Shell, 2.5¢ @ 2.6¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.40¢ @ 2.50¢; Shell, 2.7¢ @ 2.8¢; Flange, 2.9¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

Structural Material.—The demand is very large and mills are crowded to their fullest capacity and still not able to make deliveries as promptly as required. The outlook indicates a period of extended activity and possibly somewhat higher prices. An advance of ⅛¢ has been established on Beams and Channels, while other specialties are very firm at about the following prices: Bridge Plate, 2.25¢ @ 2.30¢, delivered; Angles, 2.20¢ @ 2.25¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 3.1¢ for Iron or Steel, all delivered at Philadelphia or its equivalent.

Sheet-Iron.—A firm and active market is reported along the entire line, and somewhat higher prices have been obtained for pretty much all the various numbers. For the best makes, in carload lots, quotations are about as follows:

Best Refined, Nos. 14 to 20	3¢
Best Refined, Nos. 21 to 24	3.20¢
Best Refined, Nos. 25 to 26	3.40¢
Best Refined, No. 27	3.50¢
Best Refined No. 28	3.60¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20	3¼¢
Best Soft Steel, Nos. 21 to 24	3½¢
Best Soft Steel, Nos. 25 to 26	3¾¢
Best Soft Steel, No. 27	4¢
Best Bloom Sheets, ¼¢ extra over the above prices.	
Best Bloom, Galvanized, discount	62½ %
Common, discount	65 %

Steel Rails.—The market has been very active during the past few days and some large lots have been closed, including one of about 40,000 tons for the Pennsylvania Railroad. Several other large lots have also been definitely closed, although some of them were prematurely reported two or three weeks ago. It is difficult to give exact prices on these lots, but it is safe to say that $30.50 @ $31 are firm quotations on new business. Options that were out at lower figures have been pretty generally accepted, so that the mills have plenty of work for the winter months and are expecting better prices for later deliveries.

Old Rails.—There is not much change in prices, but the offerings are light, and holders seem to expect higher prices later on. Lots in store are held at more than current quotations, which are from $24.50 to $25 bid for sea-board lots, or $26 to $26.50 delivered at mills in the interior; at which figures sales have been made during the past two or three days.

Scrap-Iron.—Prices do not change materially, although they are very firm at about the following prices: $22 @ $22.50 for carload lots, delivered; or for choice, $23; No. 2 do., $15 @ $16; Turnings, $14 @ $15; Old Steel Rails, $16.50 @ $17.50; Cast Scrap, $15 @ $16; do. Borings, $9 @ $10; Old Fish-Plates, $26 @ $27.

Nails.—The advance in cost of production has at last resulted in an advance in the card rate. Lots from store are now $2.10 for Iron and $2.20 for Steel Nails, with the usual rebate on carload lots. Stocks are light, and, with increasing cost of material, a further advance is not improbable.

Wrought-Iron Pipe—In good demand at last week's prices. Discounts are as follows: Butt-Welded Black, 50 %; Lap-Welded Black, 62½ %; Butt-Welded Galvanized, 42½ %; Lap-Welded Galvanized, 50 %.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts.
CINCINNATI, October 7, 1889.

Pig-Iron.—There have been fewer large transactions in Pig-Iron in the local market during the week under review, but prices have been further advanced throughout the West, averaging about 25¢ ₱ ton, and Southern furnaces, as a rule, have retired from the market, at least for the present, many Southern plants being heavily oversold. The inability or the refusal of producers to meet the wants of buyers has stimulated rather than discouraged the demand. In fact, the rapid advance of various kinds of Iron in other markets engenders an excited and feverish

market here. A strong conservative element, however, has guided or assisted the course of events here, and while the advance is not so great as reported at other points it is stable. It appears that the demand for Finished Iron is very large, and the heavy buying of Pig-Iron which has taken place has been little more than enough to cover contracts already placed for the manufactured product. Steel Rails have continued to have an active demand and Car-Wheel Iron has sold well. Among the larger sales reported were 1000 tons Southern Car-Wheel at $23.50; 1000 tons Gray Forge at $14.25; smaller amounts at $14.50; 600 and 500 tons No. 3 Foundry at $14.75, cash, Cincinnati. Mottled has sold at $13.75 to a moderate extent. The current prices here, at the close, cash, f.o.b., are as follows:

Foundry.

Southern Coke, No. 1	$15.75 @ $16.00
Southern Coke, No. 2	15.25 @ 15.50
Southern Coke, No. 3	14.75 @ 15.00
Ohio Soft Stone Coal, No. 1	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2	15.50 @ 16.00
Mahoning and Shenango Valley	16.00 @ 16.75
Hanging Rock Charcoal, No. 1	20.00 @ 22.00
Hanging Rock Charcoal, No. 2	19.00 @ 21.50
Tennessee and Alabama Charcoal, No. 1	17.50 @ 18.50
Tennessee and Alabama Charcoal, No. 2	16.50 @ 17.50

Forge.

Gray Forge	14.50 @ 14.75
Mottled Neutral Coke	13.75 @ 14.00

Car-Wheel and Malleable Irons.

Southern Car-Wheel	23.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 25.00
Lake Superior Car-Wheel and Malleable	20.00 @ 20.50

Manufactured Iron.—There has been a strong tone prevailing for all kinds of Structural Iron, with new orders satisfactory, but the mills are crowded with old work, the foundries are busy and the various Iron-works are well employed.

Nails.—There has continued to be a good demand and a strong market, with full prices realized. Iron and Steel Nails, 12d to 40d, sell at $2.10 @ $2.20 ℔ keg, with 10¢ rebate in carload lots, at the mills. Steel Wire Nails sell at $2.50 @ $2.60 for 60d.

Old Material.—There has been a good demand for Old Rails at $24, but there have been few offered below $26. Old Wheels have been quiet, and prices are nominal at $19, spot cash.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., Pittsburgh, October 8, 1889.

There has been increased activity in the Iron and Steel industries during the past week, and there has been a further sharp advance in prices. After the almost unprecedented business of August and September it was generally expected that October would show a lull, but the first week of the month has developed an enormous business. The sales of Bessemer Iron reported footed up 36,000 tons, of which one firm bought 30,000 tons. The fear is still expressed by some of the more conservative that possibly the market has been pushed forward and upward faster than the actual situation justifies, but we do not think as yet that there is any ground for apprehension. There is actual demand and an almost entire absence of anything like speculation. There is a very heavy demand from the West and South for all kinds of Finished Iron. There have been considerable complaints made within the past few days of a shortage of natural gas, due no doubt to the much greater consumption of the cold weather, and some of the Iron mills have expressed considerable annoyance, having had to shut down for a time.

Pig-Iron.—The market is strong and excited both for Forge and Bessemer Iron and another sharp advance is established. Forge has gone up 75¢ to $1 ℔ ton as compared with the prices a week ago and Bessemer $1.25 to $1.50. It appears that the faster the price goes up the greater the demand; buyers who before the market began to show evidence of an advance bought only as their immediate wants required are now buying all that is offered, and many of them have covered their wants up to January next and some considerably beyond that time. It is generally believed that Coke will be further advanced within the next week or two, and this has had a good deal to do with this last advance in Iron. Prices may now be quoted as follows:

Neutral Gray Forge	$16.25 @ $16.75,	cash.
All Ore Mill	17.25 @ 17.50,	"
White and Mottled	14.50 @ 15.00,	"
No. 1 Foundry	17.50 @ 18.00,	"
No. 2 Foundry	16.50 @ 17.00,	"
No. 1 Charcoal Foundry	23.50 @ 24.00,	"
No. 2 Charcoal Foundry	21.50 @ 22.00,	"
Bessemer Iron	19.50 @ 20.00,	"

Up to the present time there have been no sales of Bessemer Iron reported above $19.80, cash, but $20 will no doubt be realized before the close of the week. Sales of No. 1 mill have been made at $16.50 @ $16.75 There does not appear to be much inquiry for Foundry Irons.

Muck-Bar—Is also stronger, in sympathy with Pig-Iron, and we now quote at $29 @ $29.50 and $30, cash, according to quality and delivery. There has been but little business during the week, owing to the difference in the views of buyers and sellers, the former being unable to keep up with the latter in regard to price, which has been going up almost daily.

Spiegel—Is also on the upward move, with sales of 20 % reported at $40. Ferromanganese has again advanced sharply, with sales of 80 % reported at $89 @ $90. The latter has advanced $25 @ $27 ℔ ton in this market within the past few weeks and the tendency is still upward.

Manufactured Iron.—There is a continued good demand for all kinds of Manufactured Iron, and it is evident that prices will have to go still higher, in view of the continued increased cost of the raw material. Managers generally are refusing to contract for future delivery at present prices; they will book orders with the understanding that they are to receive market price at the time of delivery. Bars may now be quoted at 1.80¢ @ 1.85¢; Plate-Iron, 2.30¢ @ 2.35¢; No. 24 Sheet, 2.90¢ @ 2.95¢; Skelp Iron, 1.90¢ @ 1.95¢ for Grooved and 2 10¢ @ 2.20¢ for Sheared, all 60 days, 2 % off for cash.

Nails.—The Nail market continues to advance. We now quote Cut Nails at $2.10, 60 days, 2 % off for cash, and even at the price quoted it is claimed there is little or no margin for profit when the enhanced cost of Slabs is taken into consideration. It is said that Slabs can be converted into almost anything but Nails to better advantage. The present price for Nails but little more than covers cost of Slabs, and the maker has little or nothing for his labor of cutting or the cost of kegs. Wire Nails have also been advanced in consequence of the advanced cost of Wire Rods. Wheeling quotes $2.25 for 12d, 60 days, in carload lots, orders to average 25¢ or better in extras for Cut Nails.

Wrought-Iron Pipe.—There appears to be no abatement in the demand and the mills have all they can do. Now that the winter is near at hand gas and oil companies are anxious to get all the Pipe they can into the ground and they are crowding the mills with whom they have contracts. Prices remain unchanged, but they are very stiff at the association rates, and at the October meeting of the association in New York an advance is not improbable. Some manufacturers who have contracts that will absorb their entire production during the rest of the present year are opposed to advancing prices, because they would realize but little benefit, but those who are in position to make additional contracts want to have prices advanced.

Old Rails.—There is considerable inquiry for Old Iron Rails, with but few offering, and prices are still tending upwardly. We can report a sale of 1000 tons at $27, which is the highest as yet reported. However, it is said that they can be laid down here at from but few sources of supply at the price quoted. Old Steel Rails, in the absence of sales, may be quoted at $20 @ $20.50 for short and $22 for long pieces.

Steel Rails.—Market is strong and excited, but no sales reported during the week, in the absence of which we may quote at $33 @ $34. It is difficult to place an order for immediate or near-by delivery, as the mills are all well sold up for the present year.

Billets, Blooms, &c.—There is a continued active demand for Bessemer Steel Billets, and as the mills are all oversold it is difficult to place an order at any price; may be quoted at $33.50 @ $34, with a sale of 100 tons reported at $33.50. We can report a sale of 2000 tons Bloom Ends at $22.

Railway-Track Supplies.—Prices are firmer, and it is doubtful if orders of any magnitude could be placed at present rates, and they are liable to be advanced at any time; Spikes, 2.10¢, 30 days, on cars at works; Splice-Bars, 1.85¢ @ 1.90¢; Track Bolts, 2.75¢ @ 2.80¢ with Square and 2.90¢ @ 3¢ with Hexagon Nuts.

Old Material—Is more active; Sales No. 1 Wrought Scrap at $21.50, net ton; Wrought Turnings quoted at $14 @ $14.50. Sale Iron Car Axles at $28.50, gross; Old Car-Wheels at $18.50.

The Crescent Steel Company, the successors of Miller, Metcalf & Parkin, announce that the manufacture and sale of Crescent Steel will be carried on by them, there being no change in the management. The Eastern depot is at 480 Pearl street, New York, and the Western depot at 64 and 66 South Clinton street, Chicago.

St. Louis.

Office of *The Iron Age*, 214 N. Sixth st., St. Louis, October 7, 1889.

Pig-Iron.—The market has been comparatively quiet during the past week, but still maintains its firm character. There is a disposition among furnaces that have no stock on hand to dispose of to advance their quotations much above the market, while on the other hand those who have special lots which they are anxious to market are accepting the lowest figures. This condition of things causes some uncertainty in regard to prices, but as yet has resulted in no serious trouble, as most consumers are fairly well supplied with stock and the orders now being booked are generally for small lots. The only sale of any size placed during the week was 1000 tons Charcoal Foundry No. 2 at $16, f.o.b. cars, St. Louis. For ordinary-sized lots we quote as follows, for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$16.00 @ $16.50
Southern Coke, No. 2 Foundry,	15.25 @ 15.75
Southern Coke, No. 3 Foundry,	14.75 @ 15.00
Gray Forge	14.25 @ 14.50
Ohio Softeners	17.00 @ 19.00
Lake Superior Charcoal	20.00 @ 21.50

Missouri.

Charcoal Foundry, No. 1	16.50 @ 17.00
Charcoal Foundry, No. 2	15.50 @ 16.00

Tennessee.

Charcoal Foundry, No. 1	18.00 @ 18 50
Charcoal Foundry, No. 2	17.00 @ 17.50

Connellsville Coke, f.o.b. East St. Louis $5; St. Louis, $5.15.

Bar-Iron.—Jobbers report a large trade, the demand from railroads being particularly heavy. Mills are filled with orders and can hardly make deliveries fast enough to satisfy the trade. Small lots from store command 2¢, and Mills are quoting from 1.85¢ to 1.90¢.

Barb-Wire.—Business in this department continues to improve, and while there is some disposition among country merchants to curtail their orders at the advanced figures, yet the demand is of such dimensions that mills have got about all the business they can comfortably handle. Prices are firm with an advancing tendency, and unless raw material can be obtained at lower figures than at present, the quotations now ruling for Barb-Wire are likely to be withdrawn and higher figures substituted. Mills quote as follows, f.o.b. St. Louis, 60 days, or 2 % off for cash, 10 days: Painted in small lots, 3¢; Galvanized, 3.60¢, carload lots; Painted, 2.90¢; Galvanized, 3.50¢.

The Campbell Iron Company, St. Louis, Mo., have secured the agency in this city for the sale of the Eclipse Polished Shafting manufactured by Fitzsimons & Co., Cleveland, Ohio.

Louisville.

LOUISVILLE, KY., October 5, 1889.

The market has been strong but not very active, advices of heavy buying East having the effect of increasing the interest and activity at the close. Holders are very firm, but prices as a rule remain unchanged, though it is thought that the buying of large blocks of Iron East, the advance in rails and the strong demand for consumption West by those who have been holding off from buying will have the effect of increasing prices during the coming week. The demand seems to be running more to the foundry grades:

Southern Coke, No. 1 Foundry (new classification)	$15.00 @ $15.50
Southern Coke, No. 2 Foundry (new classification)	14.50 @ 15.00
Southern Coke, No. 3 Foundry (new classification)	13.75 @ 14.25
Gray Forge	13.25 @ 13.75
White and Mottled, different grades	12.75 @ 13.25
Silver Gray, different grades	13.25 @ 13.75
Southern Charcoal, No. 1 Foundry	16.50 @ 17.00
Southern Charcoal, No. 1 Mill	15.00 @ 15.50
Southern Car-Wheel, standard brands	22.00 @ 23.00
Southern Car-Wheel, other brands	18.25 @ 19.75
Hanging Rock Coke, No. 1 Foundry	15.75 @ 16.25
Hanging Rock Charcoal, No. 1 Foundry	19.75 @ 21.25
Hanging Rock, Cold Blast	21.00 @ 23.00

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, October 7, 1889.

Pig-Iron.—The market is strong, but conservative. There has not been an increased demand, neither have prices advanced as expected, but there continues to be a very firm feeling as to the future. While the demand is heavy, the feeling appears to prevail that while there is going to be a large consumption of Iron, there will be sufficient produced to supply the demand. Some furnaces are so much of this opinion that they have made quite large contracts for future deliveries upon a basis of present prices. Such sales are being made mostly with large consumers, and who are known to be men who abide strictly by their contracts. A number of the largest stacks that have been out for repairs have recently or will very soon blow in, thus adding 500 to 700 tons per day to the output.

Miscellaneous.—As has been previously intimated in *The Iron Age*, the time for the scarcity of cars is now upon us, and there is not a line in the South that can respond promptly to the wants of the shippers, notwithstanding the very large increase of the rolling-stock of the Nashville and Chattanooga Railroad, which is evidenced by the fact that during the months of August and September of the present year the line did 25 % more business than ever before during the same period and still has a great scarcity of rolling-stock. Taking this fact into consideration, what will be the condition during the months of December, January and February, which are always the heaviest months on all the Southern lines. If 20,000 additional cars were placed at once upon the Southern lines it would no more than relieve the situation. The effect of such stimulation in business has been that many new lines are being advocated. All the manufacturers are running full, which with the moving of the crop has made money matters closer than ever before.

Detroit.

WILLIAM F. JARVIS & Co., under date of October 7, 1889, say: The inquiry for nearly every grade of Pig-Iron has become quite large, and additional strength can safely be said to have been added to the already strong market. Lake Superior Charcoal has been sought for in small lots of 100 or 200 tons, but no large orders are visible. These smaller lots have brought full market figures in every case. Some furnaces have absolutely withdrawn from the market, being unable to furnish for immediate orders, and thinking the demand warrants them in declining to make quotations for delivery during any portion of the next year. The excessive demand for Gray Forge Iron has raised the price of this grade up out of proportion with better Foundry grades, and nearly as much is obtained for it as for straight Foundry No. 2 (Northern grading) in some cases. Bessemer is very strong, and, judging by the demand in the West and South during the past week for Steel Rails, will go considerably higher. Considerable of a demand has existed for Ohio Softeners at full rates. Old Rails and Old Wheels are hard to obtain at quoted figures. Market quotations are as follows:

Lake Superior Charcoal, all numbers	$19.25 @ $19.75
Lake Superior Coke, all ore	18.50 @ 19.50
Lake Superior Coke, cinder mixed	17.50 @ 18.50
Standard Ohio Black band	18.00 @ 18.50
Southern No. 1	17.00 @ 17.50
Southern Gray Forge	15.50 @ 16 00
Southern Silvery	16.50 @ 17.00
Jackson County (Ohio) Silvery	18.00 @ 18.50
Old Wheels	18.50 @ 19.50
Old Iron Rails	25.00 @ 25.50

Cleveland.

CLEVELAND, October 7, 1889.

Iron Ore.—Probably 30,000 tons of Ore in lots varying in quantity from 1500 to 7500 tons have been sold during the past week. Included in the amount was 4500 tons of Chapin Ore, to be forwarded by rail, which brought at the mine a price equivalent to $4.85, Cleveland delivery. It seems altogether probable that 300,000 tons of high-grade Bessemer Ore could be sold within the next ten days if it could be produced. The estimate of the leading Ore men, however, is that less than 200,000 tons of Ore of every kind remains unsold. The opinion is universal that the season's output of Ore will exceed 7,200,000 tons, and that fully 6,750,000 tons of this amount has already been sold. Charters are strong at $1.10 from Escanaba, $1.25 from Marquette, $1.40 from Ashland and Two Harbors. It is announced at the headquarters of the big mining companies that there is already a fair inquiry for Ore for next season's delivery. Dealers decline, however, to make any estimates regarding next season's quotations. Despite the rough weather on the lakes nearly 300,000 tons of Ore was brought down from the Lake Superior district last week.

Pig-Iron.—Charcoal Irons continue in favor. During the week several thousand tons were sold at $20.50, cash, at the furnaces. Bessemer Irons are also in great favor at $18 @ $18.50, cash and immediate delivery. Furnace men find themselves in a position where they are able to decline orders for future delivery and to refuse all concessions. The consumption of Pig-Iron from a local stand-point seems to be enormous, and stock piles are being rapidly reduced. It seems to be the fixed purpose of the furnace men to prevent any unwarranted inflation of prices. Foundry Irons, all ore, are bringing $18.30, Cleveland delivery, with an unusually good demand. The aggregate amount of Iron sold during the past week is largely in excess of any single week's business since the beginning of the present revival.

Coke.—The price at the ovens is now $1.50, an advance of 15¢ since September. It is already announced that the November price will be $1.75.

Scrap-Iron.—Dealers report a fair business in Old American Rails at $25.50 @ $26. Wrought Scrap is bringing $20 and is in fair demand.

Manufactured Iron.—Common Bar is selling at 1.70¢ with only a moderate demand. Sheets of all numbers are scarce and are eagerly taken at almost any figure.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, October 9, 1889.

American Pig.—Sales agents report the market quite active, although the sales are chiefly for fall and early winter requirements, consumers taking relatively little for 1890 delivery thus far. Quotations, especially when they are close, are held open only for a short time and are made subject to confirmation by the furnaces. It is noted, too, that Western and Virginia producers are not delivering as fast as is wanted, thus showing that they are crowded and that, on the other hand, consumers are still running very close. Thus far buyers in this section have certainly not taken alarm, although they are quite generally busy and report good prospects for work ahead. Since this market deals almost exclusively with founders, it is inferred in a general way that the rush of work has been on the whole more toward the rolling-mills and steel-works than it has been to the foundries. Mr. B. G. Clarke, of the Thomas Iron Company, expresses himself in a manner which foreshadows an advance. It is not probable, however, that the books for next year will be opened until November or December. As an indication of the situation in Bessemer Pig we may state that a leading works in the Pittsburgh district has purchased a block from a large works in the Lehigh Valley. Some of the Steel-works in eastern Pennsylvania have been making efforts to purchase Iron, their supplies from their regular sources being inadequate. We continue to quote No. 1 Anthracite Foundry, at tide-water, $17 @ @ $18; No. 2, $16 @ $17; Gray Forge, $15 @ $15.75; Southern No. 1 Coke Foundry is still available at $16.75 @ $17, although the lower figure may be withdrawn at any time; No. 2 is quoted $16.25 @ $16.50, with similar restrictions. Ohio Scotch has been advanced $1 ₱ ton, being now held, delivered in New York and vicinity, at $21 for No 1 and $20 for No. 2. Some Virginia brands have been raised to $17.75, delivered, for No. 1 and $16.75 for No. 2, an advance of 50¢.

Scotch Pig.—Nominal quotations are so high that business is out of the question. In fact, the anomalous condition is being approached that Iron is as high in Scotland as it is here.

Spiegeleisen and Ferromanganese.—We may note a sale of 10,000 to 12,000

tons of 10 to 12 % German to an Eastern mill at private terms, also a small lot of 20 % at $32.50. Ferromanganese has sold as high as $80, and for small lots, spot, as much as $85 has been paid. There is nothing of any consequence to be had for the balance of this year and the majority of makers are sold up well till March. It is believed that some demand of consequence remains unfilled.

Billets and Slabs.—The inquiry continues active. In fact, there are evidences that buyers of Billets are speculatively anticipating their requirements for a considerable period. Among the sales we note one lot of 6000 tons of 4-inch by an Eastern works to a Western Wire-Rod mill at $31, f.o.b. One Steel concern in the Pittsburgh district, having oversold, has been forced to cover in the East, purchasing during the week about 10,000 tons. The demand for miscellaneous purposes of special stock is active and full prices are being obtained. We quote $31 @ $32.

Wire-Rods.—Foreign and domestic prices are coming nearer. In Foreign Rods No. 5 is now quoted on, since the duty on them being specific, $13 44, is lower by about 50¢ than the 45 % ad valorem rate on No. 6. A small lot of about 500 tons foreign has been sold for a special purpose. The last sale of domestic was on the basis of $47, delivered, but $50 is now asked. Foreign No. 5 can probably be done at about $49 @ $49.50.

Manufactured Iron and Steel.—Only one specially large transaction is reported, that being the Third avenue car-stable, which calls for 1300 tons of Beams, including 250 tons 24-inch and a large amount of Cast-Iron work. There has been quite a heavy run of small orders and the mills are very busy. Prices show an advancing tendency all along the line. We quote as follows, on dock: Angles, 2.25¢ @ 2.35¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, advanced to 3.1¢. In Plates, Steel Tank is 2.3¢ @ 2.5¢; Shell, 2.65¢ @ 2.7¢; and Flange, 2.85¢ @ 2.95¢. For Bars we quote: Common, 1.7¢; Medium, 1.75¢ @ 1.85¢, and Refined, 1.85¢ @ 2¢. Hoops, 2.1¢ @ 2.2¢. Galvanized Sheets, 65 % and 2½ %.

Merchant Steel.—We quote: Machinery, Finished, 2.25¢ @ 2.3¢; Shafting, 2, to 4 inch, 2.15¢; Tire, 2.25¢ @ 2.30¢; Sleigh-Shoe, 1.9¢ @ 2¢, and Spring Steel, 2.45¢ @ 2.5¢, all delivered.

Steel Rails.—A very heavy business is reported, notably in the West. It is reported that the following roads have placed their orders: Union Pacific, Chicago, Burlington and Quincy, Rock Island, Northwestern, Seattle, Lake Shore and Eastern, "Big Four," Michigan Central and Lake Shore. These aggregate, it is estimated by competent authorities, 160,000, of which about 115,000 tons was taken by the Chicago mills. It will be observed that this includes the Union Pacific with 42,000 tons, which was reported closed some time since. We understand, however, that the business was not completed until Monday, although it is denied in some quarters. Besides this there have been other sales by Western mills of about 6000 tons. Eastern mills have closed about 90,000 tons, which includes about 35,000 tons taken by the Pennsylvania Railroad as a part of its requirements and 25,000 tons by the Erie. The other sales are to Eastern, Southern and Southwestern roads. In the aggregate, therefore, these transactions, which do not include the sales of all the mills, foot up to 250,000 tons. It is probably safe to say that 260,000 tons have been placed in the last ten days. This is undoubtedly an enormous quantity, but its significance should not be falsely interpreted. It simply means that a number of the leading railroads, East and West, have contracted for the greater part of their supply for renewals. The quantities are not, so far as we can learn, unusually large for any of the roads mentioned; in fact, we know that in the days of rapid extension such lines as the C., B. and Q. bought 100,000 tons in one year. The Pennsylvania has not yet taken its annual quota, which is 60,000 tons and upward. On the whole, the purchases, so far as an analysis is possible, are merely for renewal and for the usual moderate quantity of new feeders and extensions. In themselves the purchases alluded to are not indicative of any specially heavy demand for next year, but they are significant in showing that the closest and best buyers are satisfied that they cannot hope to gain by waiting. Some of them, like the Pennsylvania in the East and some of the roads named in the West, are leaders who generally have a large following among the purchasing agents of other roads. Their buying is generally the signal for the opening of negotiations by others, and from this point of view the transactions recorded are of special importance. Even now large negotiations are pending in the West, and there is considerable inquiry in the East. The tendency of the market is sharply upward, and some of the Eastern mills are asking $32, while others quote $31. A meeting of the makers was held on Saturday, but nothing of any consequence appears to have been done beyond the ratification of the August agreement by one of the leading Western mills whose signature was not yet appended.

Old Rails.—Sales in lots of 200 to 800 tons, aggregate about 3000 tons, of which the greater part has gone to Pittsburgh, the price paid in the majority of cases being equivalent to about $24 here. Old Rails are offered for shipment from abroad at $24 @ $24.50. The stock here is very small and is held by parties who have had them for a long time and show little disposition to let go except at a considerable advance on present figures. We note also a sale of 200 tons Old Steel, long lengths, at $19.

Track Material.—The market is active and there are large inquiries in the market. Prices have advanced and we now quote, delivered, $2.10 @ $2.15 for Spikes, 1.95¢ @ 2¢ for Angles, and 2.9¢ @ 3¢ for Square and 3¢ @ 3.25¢ for Hexagon Bolts.

Metal Market.

Copper--London improved since our last report from £42. 15/. spot, to £43 and futures from £41. 15/ to £42. 5/, sales aggregating 350 tons. In our own market consumers have been buying a little more freely on the basis of 9¼¢ for casting brands, Lake being nominally 11¢ and Arizona, Montana and Electrolytic 10¼¢.

Tin.—London has been tending upward during the week under review, spot rising from £89 to £90. 10/ and futures from £89. 15/ to £91. 5/, sales summing up 630 tons. The scarcity of available supplies and of fresh ones from London has continued to exercise a strengthening effect on spot and October delivery, leading to sales since we last reported of, altogether, 200 tons spot at 20.20¢ @ 20.65¢; October at 20.40¢ @ 20.55¢; November at 19.95¢, and December at 20¢ @ 20.20¢. The spot quotation to-day is 20.75¢ @ 20.87½¢; October, 20.50¢ @ 20.62½¢. Spot closes firmly held at 21¢, 20.87½¢ having been refused. *Tin-Plates.*—Under the stimulus of a good consumptive demand and a still rising English market Plates have ruled active and firm at the quotations below. There were exported from England during the first eight months to all quarters 290,832 tons, against 263,562 and 235,901, respectively, in 1888 and 1887; to this country alone there went out of the amounts named, respectively, 229,975, 196,388 and 179,296 tons. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, $5 @ $5.50; Coke finish, $4.70 @ $4.75; Ternes, $4.10 @ $4.30; Coke Tins, Penlan grade, $4.35; J. B. grade, $4.40, and Wasters $4.15 @ $4.20.

Lead.—There has been nothing done in a wholesale way during the week, the quotation in the open market being 3.90¢ nominally, while the Western markets are inactive at 3.75¢.

Spelter—Has for the time being relapsed into a dull mood, and is 5.10¢ nominally for Common Domestic, Silesian at the same time being quoted 6½¢, as heretofore.

Antimony.—Cookson now commands 19¾¢ @ 20¢, while Hallett may be quoted 18¢ nominally, the market being bare of this brand.

New York Metal Exchange.

The following sales are reported:

THURSDAY, October 3.

25 tons Tin, November.....19.95¢

FRIDAY, October 4.

10 tons Tin, spot.....20.20¢
10 tons Tin, December.....19.95¢
25 tons Tin, November.....20.00¢
25 tons Tin, December.....20.00¢

SATURDAY, October 5.

10 tons Tin, delivery first half October.....20.55¢
20 tons Tin, spot.....20.45¢
10 tons Tin, December.....20.20¢
10 tons Tin, spot.....20.65¢

TUESDAY, October 8.

100 tons Iron, January.....$16.75
100 tons Iron, January.....17.00
35 tons Tin, October.....20.40¢

Coal Market.

The fall trade has not yet acquired anything like the activity usually noticed at this season, although some improvement is noticed and cooler weather is a cheering indication. The fact remains that business is disappointing, insomuch that while prices are nominally unchanged the market is weak and the regular schedule only approximates the actual figures. As compared with prices last spring the change is not radical. The bulk of business done is on old orders, but the better demand for domestic sizes must eventually quicken the movement with large operators. Production for the week ending 5th inst., 767,000 tons, as compared with 855,000 tons for the corresponding week last year. Since January 1 the aggregate is 26,128,000 tons, against 28,391,000 for the same time last year, a decrease of about 2,263,000 tons.

Bituminous Coal is quite active, with orders on a more liberal scale, but business is somewhat restricted by the lack of cars and the scarcity of vessels. It is said that many cars are diverted from the coal business for other freight. Quotations are $3.25, f.o.b., and prices are firmer. Cumberland reports 58,658 tons; Clearfield, 54,000 tons; Pocahontas, 39,000; Chesapeake and Ohio, 40,000 tons.

Reading reports for the week 180,000 tons, of which 47,000 went to Port Richmond and 18,000 tons to Port Liberty.

A Pottsville letter says: "The Anthracite Coal trade continues dull, prices are lower and wages of miners are at least 10 % less than at this time last year. The curtailment of production of Coal for September made no perceptible change for the better in trade. The demand did not consume the decreased tonnage and the quantity at tide-water points increased rather than diminished. The outlook for October is not encouraging, and in the face of the fact that Coal averaged 25¢ ₱ ton more in 1888 than now dealers and the shipping companies are not over-

sanguine. The boom in the iron business, however, has given considerable life to the Furnace Coal trade."

The rate of wages to be paid the Anthracite-Coal miners in the Schuylkill region for the month of September is 5 % below the $2.50 ℔ ton basis. The average price received for Coal at the mines in that month was $2.33 ℔ ton, compared with $2.59 in the corresponding month of last year.

The old Hawk's Nest mining property in Fayette County, W. Va., which embraces several thousand acres of Bituminous Coal land, has been secured by a large number of well-known capitalists, including Levi P. Morton, Vice-President of the United States, and his partner, Mr. Bliss, Abram S. Hewitt and others of equal note, and several million dollars will be embarked in the enterprise.

Financial.

The disturbance in money has engaged the larger share of attention during the week, and its causes are made the subject of careful inquiry. For obvious reasons the conclusion is reached that money in this market is not likely to be in excess during the remainder of the year, although comparative ease may be expected as a consequence of the heavy exports of cotton now in progress, and an outward movement of wheat later on will be a natural order of events. Taking advantage of a sudden loss of specie not only by the New York Associated Banks, whose reserves fell below the legal limit for the first time since May, 1884, but by the United States Treasury as well, also by the banks in Europe, rates in New York for temporary loans ran up to 30 % and averaged for the week 8 %. London was drawn upon heavily both by South America and for the Russian loan. New York felt the pressure from the fact that the Rothschilds, in filling their engagements, decided to order gold from this side even at a considerable loss rather than risk a disturbance in London that might cause the Bank of England to advance its discount rate, to the detriment of various interests with which they are identified. Accordingly shipments were made to the extent of $1,500,000 and additional amounts were obtained from the Bank of France. It is surmised that in case the European market is subjected to further pressure from like causes American securities may be returned for gold, perhaps to a considerable extent.

The Stock Exchange market was adversely influenced by stringent money. On Thursday stocks were weak, Atchison, St. Paul and Reading showing the principal decline. Atchison reached the lowest price yet recorded. St. Paul was affected by a decrease in earnings. The bank statement of Saturday was a surprise, but had little effect on values, and a sharp drop occurred in Sugar and Cotton-Oil, followed by recovery at the close. On Monday stocks were quiet, except Sugar and Cotton-Oil trusts and Atchison. The trusts fell over 2 %. Less than a month ago Cotton-Oil stock sold up around 50; on Monday it was within a fraction of 38. Sugar Trusts a month ago were quoted around 110; on Monday the price was barely above 80. On Tuesday the market yielded to speculative tactics and several important declines were recorded, in which Sugar Trust and the coal shares participated, but there was recovery at the close.

Government bonds were quoted as follows :

U. S. 4½s, 1891, registered	105¾
U. S. 4½s. 1891, coupon	105¾
U. S. 4s, 1907, registered	127
U. S. 4s, 1907, coupon	127
U. S. currency 6s	118

The bank return for the week shows a decrease of $2,603,800 in surplus reserve, which now stands at $1,688,850 deficiency. The loans show a loss of $1,995,200; the specie is decreased $2,252,300; the legal tenders are down $1,614,100; the deposits other than United States are decreased $55,050,400. The loss resulted in large measure from interior demands. Western New York was quite urgent and the proportion to the South was increased, but it is noticed with satisfaction that since Monday the rates of exchange at Western centers are for the first time recently in favor of New York. It is noted that the State banks, although not subject to the national law requiring 25 % of deposits to be kept in hand, are in a pretty conservative position. The money market is active, with less liberal offerings. Time loans are in demand, with no business except on first-class collateral. In other words, money is going more exclusively into legitimate channels. Commercial paper is in a little better demand and the supply is increasing. Rates are 6 % for 60 to 90 day indorsed bills receivable, 6½ % to 7 % for four months' acceptances and 7 % to 8 % for good single names having from four to six months to run.

A statement prepared at the Treasury Department shows that there was a net increase of $14,711,990 in circulation during September and a net decrease of $10,597,253 in money and bullion in the Treasury during the same period. The principal increase in circulation was in United States notes, silver certificates and standard silver dollars.

The general business of the country is prosperous. Bank clearings of 42 leading cities show an increase of 2.8 % over last year; outside of New York the increase was 3.1 %. Eastward shipments from Chicago were larger than for the corresponding week last year. Weather in the wheat and corn region was favorable for securing the fall crops, and cotton-picking is nearly finished. Tobacco is housed in good condition. Exports of provisions are away ahead of those of last year. The breadstuffs and grain markets are dull; prices steady. Coffee is firm at ¼¢ decline. Sugars weak. Ocean freights are firm, and steamers are wanted, especially for cotton. Dry goods jobbers report business more active, and agents notice an exceptionally good demand for spring fabrics.

Exports from New York for the week were again large, making a total of $7,935,000, against less than $6,000,000 for the corresponding week last year. The imports were $8,066,000.

Railway building has not been entirely at a standstill this year, for the latest statistics show that over 3300 miles of main-line track have been laid since the year began. Out of the total the South has built 1353 miles, or considerably more than one-third, reflecting a reviving industry in that section.

It is reported from Ottawa that the Dominion has determined to adopt a banking system similar to that in the United States.

Imports.

Hardware, Machinery, &c.

Boker, Hermann, Arms, cs., 36
Brinckerhoff, Turner & Co., Mach'y, case, 1
Degrauw, Aymar & Co., Chains, pkgs., 22
Field, Alfred & Co., Arms, cs., 18; Mdse , cs., 24
Folsom Arms Co., Arms, cs., 16
Graef Cutlery Co., Cutlery, cs., 5
Hartley & Graham, Guns, cs., 9
Kittridge Arms Co., Mdse., cs., 3
Lamarche, H. J. & Son, Nails, bbls., 7
Pim, Forwood & Co., Mach'y, bxs., 5; ditto, pcs., 13
Richard, C. B. & Co., Mach'y, cs., 2
Richardson & Boynton Co., patterns, box, 1
Somner, C. P. & Co., Mach'y, pcs. and pkgs., 8
Schoverling, Daly & Gales, Arms, cs., 20
Tryon, E. K., Jr., & Co., Mdse., cs., 12
Ward, Jas. E. & Co., Mach'y, cs., 5
Wiebusch & Hilger, Lim., Arms, cs., 5; Mdse., cs., 29; Anvils, 280
Weriemann, W., Arms, cs., 33
Witte, John G. & Bro., Cutlery, cs., 7

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, October 10, 1889.

The Pig-Iron market has been even more buoyant this week than last, speculation showing excitement, while the purchases for consumption and export have also been on a large scale. Scotch warrants sold up to 52/4 and Middlesborough to 47/6. Makers' brands of Scotch have undergone a further rise of 1/ @ 3/ and Hematites are up to 60/. The market is in such shape, however, that all quotations are more or less nominal. Operations have been stimulated to some extent by reports that Glasgow stocks decreased to the extent of 5000 tons last week. The exports of Pig-Iron to the United States last month were, according to the Board of Trade returns, about 13,000 tons, against 12,000 tons during September, 1888.

The decline in Block Tin last week to £88. 12/6 was attributed to free offerings of cash and forwards, but there was a quick rally of 15/ under the influence of purchases to cover "short" sales, and subsequently a further rise due in part to the excitement in the Iron market and cheaper rates for money. The consumption is quite heavy, and deliveries have run slightly in excess of the fresh supplies.

Business in Tin Plates has been active and prices are again higher; 14/ was paid for Bessemers and makers generally are asking an additional advance. At a meeting held at Swansea the makers resolved to form the South Wales, Monmouth and Gloucester Plate-Makers' Union. The object of the combination is the protection of masters against unjust demands and to better control the workmen. The agreement has been signed by firms representing 200 mills. In the event of a strike occurring at any works the union will assist the owner at whose works the trouble may exist and the loss by the stoppage will be made good. The stock of Plates at the British shipping ports is 361,000 boxes, against 191,000 boxes at the corresponding period last year. The exports to America last month were 29,000 tons, an increase of 3000 tons over those for September, 1888.

Copper has been more active, with the business chiefly in Merchant-Bar warrants and continued readjustment of contracts. Heavy deliveries of prompts are due and the outside market is "short." Warrants for delivery against contracts for furnace material are abundant, owing to smaller arrivals of American Matte. There have been sales of 700 tons Boston and Montana at 8/. About 1800 tons Anaconda now on sale.

Old Material is held for higher prices by all owners of the same and Rails are in particularly brisk demand. The Continental markets for Iron and Steel in general are strong, with a continued upward movement of prices.

Scotch Pig.—All brands held higher and the market strong and active.

No. 1 Coltness,	f.o.b.	Glasgow	70/6
No. 1 Summerlee,	"	"	68/6
No. 1 Gartsherrie,	"	"	67/6
No. 1 Langloan,	"	"	69/
No. 1 Carnbroe,	"	"	55/
No. 1 Shotts,	"	at Leith	67/6
No. 1 Glengarnock,	"	Ardrossan	65/
No. 1 Dalmellington,	"	"	57/6
No. 1 Eglinton,	"	"	56/

Steamer freights, Glasgow to New York, 4/: Liverpool to New York, 10/.

Cleveland Pig.—Prices are up 2/3 and the market active and strong. No. 3 Middlesborough quoted 47/6, prompt.

Bessemer Pig.—Sales made at 60/ and holders now asking more. West Coast brands, mixed numbers, 60/, f.o.b. shipping point.

Spiegeleisen.—Supplies very moderate. Demand fairly active. English 20 % quoted 83/9 @ 85/, f.o.b. at N. W. England shipping point.

Steel Rails.—Prices are up 5/ and the market is strong and active. Heavy sections quoted at £5. 12/6 and light sections £6 @ £6. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—The demand active and prices 15/ higher. We quote £5. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—Makers' prices are 15/ higher and the demand is fairly active at the advance. Bessemer, 2½ x 2½ inch, £5. 5/ @ £5. 7/6, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is not much doing, but makers' prices are higher. Bessemer, £5. 5/, f.o.b. at N. W. England shipping point.

Old Rails.—The demand fair; holders very firm. Tees quoted at £3. 4/6 and Double Heads £3. 7/6, f.o.b.

Scrap-Iron.—The market more active. Heavy Wrought quoted £2. 12/6, f.o.b.

Crop Ends.—Former prices quoted, nominal. Business moderate. Bessemer quoted £2. 15 @ £2. 17/6, f.o.b.

Tin-Plate.—The demand fair, makers' prices higher than best paid at Liverpool. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	15/3 @ 15/6
IC Bessemer Steel, Coke finish	14/ @ ....
IC Siemens " " "	14/3 @ ....
IC Coke, B. V. grade	13/6 @ 13/9
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—Business in this branch has been large and prices are strong, with a further advance on Welsh Bars. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Marked Bars	8	10	0	@	8	15	0
" Common "	7	0	0	@	7	5	0
Staff. Bl'k Sheet, singles	8	15	0	@	8	17	6
Welsh Bars (f.o.b. Wales)	7	2	6	@	7	5	0

Copper.—There is still a good demand. Chili Bars quoted at £42. 15, spot, and £41. 10/, three months' futures. Best Selected, £48.

Tin.—The market quieter to-day but firm. Straits quoted at £90. 10/, spot, and £91. 5/ for three month's futures.

Spelter.—The market very firm. Quoted at £22 for ordinary Silesian.

Lead.—Market steady but quiet. Quoted £12. 10/ for Soft Spanish.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira	19.3
Florin (Netherlands)	40.2
Florin (Austria)	35.9
Milreis (Portugal)	$1.08.
Milreis (Brazil)	54.6
Mark (Germany)	23.8
	Pounds
Kilogram	2.205
Picul	134.

GERMANY.

HAMBURG, September 28, 1889.—*Iron.*—There has been an uninterrupted steady rise in the Rhenish-Westphalian market. The demand for Pig cannot be filled to its full extent at present. Of Spiegel there has again been bought a line of 10,000 tons for the United States at prices 10 marks ℔ ton higher than the previous sale, while negotiations are pending for a larger lot of 10 to 12 %, for which last week the quotation was still 76 marks, but more may have to be paid to clinch the bargain. The quotation for Forge Pig is 63 @ 69; White Steel, 68.50 @ 70, and Foundry, 63 @ 73; Thomas, 56 @ 58; German Bessemer, 67 @ 68. For some time past there has also been a good export demand for Merchant Iron, now again raised 5 marks ℔ ton. The only branch lagging behind is the Wire branch, because there is nothing doing for export. The quotation for Wire Rods is 127.50; Bessemer Steel Rails, 135 @ 140; ditto for Mines, 140 @ 145.—*Borsenhalle.*

BRAZIL.

PARA, October 1, 1889.—*India Rubber.*—The September receipts have amounted to 1020 tons, whereas the deliveries in New York were 750 tons Para and in Europe 650 tons.—*Per cable direct.*

AUSTRALIA.

MELBOURNE, VICTORIA, September 12, 1889.—*Iron.*—The market is in good position, enabling importers to obtain full rates. The quotation for Galvanized Iron is £19. 10/ for No. 26, and Fence-Wire No. 8, £10. *Tin.*—Shipments since September 1 from Australia and Tasmania amount to 300 tons. *Petroleum.*—The official report from New Zealand about the Taransaki District oil-fields is highly favorable, especially as regards the vicinity of New Plymouth. The soil is literally soaked with Oil, so that no wells for drinking-water can be sunk. Engineer Gordon reports that the area of the fields is very large.—*Per cable via London.*

SPAIN

BILBAO, September 21, 1889.—*Iron Ore.*—This has been a quieter week, the dealings being restricted to a few single cargoes, nothing having been done in contracts for delivery next year. Current figures are 9/3 @ 9/6 for Campanil and 7/6 @ 8/ for Rubios superiores. There are indications that the next sale of Campanil will be at 10/. Shipments so far this year sum up 2,816,764 tons, against 2,794,401 in 1888 and 3,285,395 in 1887. *Pig-Iron* as well as *Freights* have been rapidly tending upward.—*Bilbao Maritimo y Comercial.*

Marquette Iron Projects.

There are indications of a revival in the near future of the attempt to manufacture pig-iron with mineral fuel at Marquette, Mich. A furnace has been standing idle there for a number of years which was operated with anthracite and coke during the halcyon days of 1872, when prices were so high that pig-iron could be manufactured almost anywhere and under any conditions at a profit. Another furnace in the vicinity has been operated on either mineral fuel or charcoal, as circumstances warranted, but has also been idle for most of the time during recent years. It was supposed that these furnaces would never be again put in blast, owing to the very low cost at which iron can be made in other sections of the country, but the claim is now put forth that recent improvements in transportation will enable the Marquette furnaces to be profitably operated on coke. A powerful transfer-steamer has for a year past been running as a ferry-boat across the Strait of Mackinac, connecting the railroad system of the northern peninsula of Michigan with that of the southern peninsula, enabling through train service to be conducted. The obstacle to direct railroad communication between Marquette and the great sources of coal and coke supplies has thus been overcome to a great extent, as it only remains to be seen whether the boat will be able to keep its channel open during a very severe winter. Ore trains are expected to run during the winter from the Marquette range mines to the vicinity of Pittsburgh, and return laden with coke or coal when once the power of the boat to keep the channel open has been thoroughly demonstrated. Those who are investigating the question of manufacturing coke pig-iron at Marquette state that limonite ore will probably be used, which can be mined and delivered to the furnaces so cheaply that with a reasonable price for coke the resulting pig-iron should not cost over $10 per ton. If such expectations could be realized Marquette would soon be the seat of a large pig-iron industry that would greatly add to its commercial importance.

In connection with the above information, which comes from personal communication with parties interested, a dispatch is published, which originates at Milwaukee and is dated the 4th inst., as follows: "A combination of Cleveland, Milwaukee and Marquette men who are desirous of dividing the non-Bessemer iron-ore trade with the Schlesinger syndicate proposes to erect large furnaces near Marquette, Mich., and to convert ore from their own mines into merchantable iron. They have secured options on non-Bessemer mines capable of producing not less than 500,000 tons of ore annually, and plan to manufacture their own coke with prison labor. The city of Marquette has recently purchased a fine water-power and a large tract of land on the Dead River for electric-lighting purposes, and will, it is said, give the concern all the land necessary and furnish the power and light for a term of years. Under these conditions it is estimated that good, merchantable pig-iron can be made for $10 per ton, or as cheaply as at Birmingham, Ala. W. A. Severson, of this city; J. M. Nestor, formerly Mayor of Marquette, and Editor Russell, of the Marquette *Mining Journal*, are among the promoters of the scheme. 'We consider,' said Mr. Severson to-day, 'that Marquette has advantages over any other Lake Superior point, because, for one reason, there are in the Marquette district immense deposits of non-Bessemer ore which at present it does not pay to ship, but which, if properly handled, will produce first-class iron. A new State's prison, with accommodations for 400 inmates, has just been completed at Marquette, and the intention is to utilize the labor of these men in manufacturing coke for use in the furnaces. This would not interfere with any free labor because there is no coke industry in Michigan, and in no other way can we make coke as cheaply as they do at Connellsville, where the men receive an average of 85 cents per day. We can take coal from lower lake ports to Marquette in ore cars, which ordinarily go back empty, for 50 cents per ton. At present the new prison has but 28 inmates, but more men would be transferred from the penitentiary at Jackson if work could be found for them. The prison is located on the shore of the bay and could easily be provided with dock facilities. We estimate that such a plant as we want to start in with will cost about $250,000.'"

It will be observed that these projects are directed to the manufacture of pig-iron of a character to compete with Southern pig-iron for foundry purposes, in which the Northwest has hitherto been deficient, as the furnaces of that section almost exclusively use high-grade hematite ores low in phosphorus.

It is reported that the Illinois Steel Company will build four new blast-furnaces and will remodel their South Chicago works so as to carry the capacity up to 1000 tons a day.

Peru's financial prospects have suddenly brightened, both branches of the Legislature having accepted an arrangement proposed by the European bondholders which not only averts the threatened permanent forfeiture of the nitrate provinces, Tacna and Arica, but affords an assurance that funds will be advanced for important internal improvements. The development of the mortgaged provinces will mark a new era. On the other hand, Peru by the same act is virtually placed in the hands of a receivership.

Hardware.

A good volume of business is doing and a confident feeling prevails. The condition of the Iron market and the perceptible strengthening of prices in goods that lie near the raw material has much to do with this, the indications pointing to better prices and the continuance of an excellent demand for goods. Announced changes in price are comparatively few, but in Heavy Hardware there is a perceptible advance.

Barb-Wire.

The New York market continues strong, notwithstanding the fact that, as usual at this season of the year, transactions are limited in amount. At a meeting yesterday of the Eastern manufacturers a further advance was made and the following prices were determined upon: Four-Point Galvanized, carload lots, 3.75 cents; 3-ton lots, 3.85 cents; smaller lots, 4.05 cents, with the usual deliveries. These prices are firmly adhered to, the manufacturers showing no disposition to make concessions.

There are rumors current in regard to a comprehensive and far-reaching movement for the control of the market in this line, but the negotiations have been carried on with unusual secrecy, and manufacturers are very reserved in regard to the matter, so that there is but little definitely known to the trade on the subject. The negotiations are referred to in the daily press as looking to the formation of a Barb-Wire trust, but we are requested to state by the parties actively identified with the enterprise that the proposed arrangement is not of the nature of a trust. It is thought by some who are familiar with the matter that it will be brought before long to a successful issue and that the result will be a material strengthening of the market in the lines brought under control. There is still, however, at this writing some uncertainty as to whether the proposed measures can be carried into effect. In the meantime Barb-Wire is decidedly firm and has an upward tendency.

Cut Nails.

The market has advanced and is quite active at about $2 for Iron Nails for carloads and $2.15 to $2.20 for Steel Nails. For the first time in many years the majority of sellers find it possible to maintain an independent attitude. There is some talk of fixing a specified difference between Iron and Steel Nails. It may be questioned whether that will be practicable for any length of time. Present conditions are unusual in the East. With the high prices for Steel Slabs and their scarcity, Steel Nails cannot be made as cheaply as Iron Nails. Ordinary Forge Pig has advanced only about $1 to $1.25, so that those who puddle their own iron can manufacture for little more than they did before. Steel Slabs have risen very much, so that Steel Nails cost far more to make than they did. The result will naturally be that Iron Nails can be bought for considerably less money relatively. The difference in quality is certainly not an equivalent of the difference in cost, and buyers will therefore do best to purchase the Iron Nails for the present.

Wire Nails.

The situation as regards standard Nails remains substantially as at our last report, the general tone of the market being somewhat firmer, with more uniformity in the announcement of the advanced prices. The quotation remains $2.50 at mill, with an abatement of 10 cents for carload lots. Manufacturers refer to this advanced price as not covering the increased cost of manufacture, and it is thought not unlikely that there will be a further advance in the near future. The Nails in papers are also quotably higher, an advance of about 10 per cent. having been made by the manufacturers using the association list. There has not as yet been an announcement of reduced discounts by the Tack manufacturers, but this matter is under consideration and it is probable that an advance will soon be made.

Miscellaneous Prices.

In sympathy with the tone of the market on the other side a further advance has been made in the price of Peter Wright's Anvils, and an advance of ¼ cent per pound has accordingly been made by the importers, as well as in the general price of the goods.

Cincinnati Tool Company, Cincinnati, Ohio, are putting on the market the Cincinnati Bell-Hanger Bit, which is intended for bell-hangers, telephone and telegraph work. It is a Twist-Drill, sharpened and adapted for use in wood. It is described as made of the best steel, not liable to be injured by coming into contact with nail or screw, and as going through plastering and brick walls, while it can be easily sharpened on an emery-wheel or grindstone. The following is the price-list for these Bits, which is subject to a discount of 30 per cent.:

Sizes.	12 in. Each.	18 in. Each.	24 in. Each.	30 in. Each.	36 in. Each.
6-32.....	$0.42	$0.58	$0.75	$0.92	$1.08
8-32.....	.42	.58	.75	.92	1.08
10-32.....	.46	.63	.79	1.00	1.08
12-32.....	.50	.67	.83	1.00	1.08
14-32.....	.58	.75	.92	1.08	1.17
16-32.....	.67	.83	1.00	1.17	1.25
18-32.....	.75	.92	1.08	1.25	1.33
20-32.....	.83	1.00	1.17	1.25	1.33
22-32.....	.92	1.08	1.25	1.33	1.42
24-32.....	1.00	1.17	1.33	1.42	1.50
26-32.....	1.08	1.25	1.42	1.50	1.50
28-32.....	1.17	1.33	1.50	1.58	1.58
30-32.....	1.25	1.42	1.58	1 67	1.67
32-32.....	1.33	1.50	1.67	1.67	1.67

John P. Lovell Arms Company, Boston, Mass., have purchased the entire stock of Semi-Hammerless Breech-Loading Guns and Revolvers made by the American Arms Company. Under date October 3 announcement is made that the price of the Semi-Hammerless Single Gun thus purchased has been advanced $1. It is also stated that this lot is the last that will be manufactured.

The firmness which has recently prevailed in the Chain market continues and results in the withdrawal of quotations which have been out, advanced prices being generally named.

Iron Fittings are held firmly and manufacturers are showing a disposition to advance prices, though no formal announcement of such has been made.

The Wire market is very firm, and, notwithstanding the gradual advance that has been made during the past few weeks, there is still a tendency toward higher prices, and some of the manufacturers have within the past few days made slight advances. This condition of things is rendered necessary by the advanced cost of the raw material.

American Tool Company, 200 West Houston street, New York, issue a circular referring to their line of Tool-Chests and calling special attention to the Universal Tool-Chest, which is made from selected chestnut wood trimmed with heavy bands and bases, japanned lifting-handles and is varnished. It has a screw tumbler-lock and two sliding tills or compartments for small tools. Its size is 17¾ inches long, 9¾ inches wide, 10 inches deep inside and contains 42 asorted tools. It is listed at $13, which is subject to a discount of 50 and 10 per cent.

Items.

The advertisement of Wrought-Iron Forged Ox-Shoes, on page 75, will be regarded with interest. It will be observed that it represents the Shoes of the Scranton Forging Company, Scranton, Pa., and the Atwater Mfg. Company, Plantsville, Conn., who thus jointly bring them to the attention of the trade. It will be remembered that there was recently litigation in regard to the patents on these Shoes, but an amicable understanding has been reached and the patents are now owned jointly by these two companies.

The Richards & Conover Hardware Company, wholesale dealers in Hardware at Kansas City, Mo., have issued a 50-page catalogue of seasonable goods, covering both Shelf and Heavy Hardware. The goods illustrated embrace Axes, Saws, Stove-Boards, Coal-Hods and other Stove appendages, Hollow-Ware, Meat Choppers, Oil Stoves, Scoops, Presses, Washing-Machines, Wringers, Huskers, Skates, Gun Implements, &c. They handle the Never Break Hollow-Ware manufactured by the Bronson Supply Company, of Cleveland, who are now turning out 2500 pieces of this ware per day. It is illustrated in the catalogue. Full price-lists accompany the illustrations. A special feature of the catalogue is the special price-lists given, such as the Standard Steel Wire-Nail list, the Miscellaneous Wire-Nail list, the National Steel Cut-Nail list, Ammunition lists, Standard Bolt lists, Iron-Screw list, Steel-Screw list, &c.

J. W. McDonald, manufacturer of McDonald's Patent Improved Saw-Tool, has removed from Cheboygan, Mich., to 4037 Vincennes avenue, Chicago, which will hereafter be his business address. This Tool is intended for fitting cross-cut and one-man saws, combining in one implement a jointer, saw-set, tooth-gauge, set-gauge and swaging-hammer, and has been illustrated in our columns. Mr. McDonald has met with encouraging success in introducing his clever device, which is handled by the leading Hardware jobbers. Repeated orders have been constantly received wherever they were tested by trial lots. They are particularly in demand among farmers and lumber men.

The creditors of Gibson, Parish & Co., Cabinet Hardware merchants, of Chicago, met in that city on the 2d inst. and decided to settle for 50 cents on the dollar, to be paid in eight quarterly installments, with 6 per cent. interest. The payments are to be divided among the three firms succeeding Gibson, Parish & Co., in the ratio of their equity of the old firm. An indictment has been found by the Grand Jury of the county against Book-keeper Clifford, formerly employed by the firm and who has disappeared with his accounts some $30,000 short. In case he is apprehended and any of the money recovered, the creditors have decided that it shall go to a trust fund for their benefit.

Surpless, Dunn & Alder, 97 Chambers street, New York, have been appointed general agents for the York Flint Paper Company, York, Pa., manufacturers of Sand-Paper and dealers in Ground Flint. Their varied line is shown in a convenient price-list. The company will shortly have a full line of Emery-Paper and Emery-Cloth and Garnet-Paper. The advantages which are given them in the possession of their quarries are alluded to.

L. & I. J. White, the widely-known manufacturers of edge-tools and machine-knives, Rochester, N. Y., have received, we are advised, the highest award given to any manufacturer of edge-tools. It is in the form of a solid silver medal, appropriately engraved. The exhibit is

shown in the United States section in a handsome large case of quartered oak and plate-glass, and contains samples of several hundred varieties of edge and coopers' tools made by the firm. The case is surmounted by a huge buffalo's head.

The catalogue of H. Belmer & Co., 47 W. Pearl street, Cincinnati, Ohio, illustrates their line of Wire Goods, Wire Fencing and Nettings, Barb-Wire, Plain Fence Wire, Staples, &c. Of these goods illustrations are given, with descriptive matter and list prices.

The illustrated price-list of Heller & Bros., Newark, N. J., which represents their Blacksmiths' Tools, shows the varied line which has been on the market, and also a Hoof-Parer added the present year.

We are advised that the burning of the machine-shops, offices, &c., of the Oliver Iron and Steel Company, Pittsburgh, for whom H. B. Newhall & Co., 105 Chambers street, New York, are agents, will not interfere with the prompt filling of orders, the works fortunately not having been injured.

Horton, Gilmore, McWilliams & Co., of Chicago, are introducing the Wrought-Steel Door-Locks manufactured by the Russell & Erwin Mfg. Company. These Locks are referred to as thus much stronger than if the case were cast-iron, while the Lock itself is much lighter, which is a consideration when quantities of such goods are being shipped. These Locks are finished in ivory-black instead of japan, thus securing not only a very handsame finish but a more durable one, as the coating will not scale off if struck with a hammer. Nickel-plated Keys are furnished, susceptible of 12 changes. The screws accompanying the Locks have a nail point so that they can be started with a hammer, and a few turns with a screw-driver will then fasten them tight.

Stewart & Baker, Rochester, N. Y., issue a convenient catalogue illustrating their Hardware specialties. It relates to the Common Sense Sash-Balance, Automatic Center-Rail Sash-Lock, U. S. Sash-Lift, Common Sense Curtain-Fixtures, Rochester Shawl and Book-Strap, Rochester Sad-Iron, Security Hames-Fastener and Rochester Broom-Holder.

E. DeF. Shelton, 57 Broadway, New York, who is known to the Hardware trade as president of the Shelton Company, of Birmingham, Conn., and also of the Derby Silver Company, of the same place, is now devoting his attention as agent for cities, villages and towns to furnishing information to manufacturers in regard to localities in which inducements are offered to them to settle. He is accordingly in position to give information in regard to localities, capital that is available in the extension of business and inducements in other ways which are given by the localities represented by him. He issues a circular, entitled "The Manufacturer's Opportunity," in which full explanation is given of the features of this new departure and of the character of the service that he is in a position to render.

The well-known Hardware house of Kellogg, Johnson & Bliss, at 108 and 110 Randolph street, Chicago, was burned on the evening of the 5th inst. The fire originated in the basement beneath the shipping room of Klemm, Smith & Co., dealers in picture-frames, who occupied a part of the building and had a large quantity of excelsior stored there as packing material. Kellogg, Johnson & Bliss carried a stock worth about $125,000 to $130,000, on which they had an insurance of over $100,000. The firm of Kellogg, Johnson & Bliss is an old Chicago institution, but only since last May has it been carried on by its present owners, Messrs. Bliss, Bullard & Gormley. The 1st of May the firm of Bullard & Gormley, of No. 106 Lake street, purchased the controlling interest in the firm of Kellogg, Johnson & Bliss from Messrs. Kellog and Johnson, who have since retired from the concern. The former firm name, however, has since been retained. The building which they occupied was owned by Philadelphia parties. They have secured a fine building at 78 and 80 Randolph street, into which they can immediately remove, so that their business will go on without more loss of time than would naturally occur from such an interruption as they have experienced. They are fortunate in being able to secure this building, which is an eligible location and will give them a great deal more room than they previously had, but which was greatly needed by their growing business. The new building is four stories high, with a basement, and the whole of it will be occupied by the firm. The fire occurred at a most unfortunate time for them, as they were exceedingly busy and were looking forward to a more than usually heavy fall trade. Their energy was displayed in the promptness with which they proceeded in temporary quarters to get out back orders early on Monday morning. The Prescott Hardware Mfg. Company, manufacturers of Prescott's Trackless Door-Hanger, were burned out at the same time and place, and will also remove to 78 and 80 Randolph street.

Mr. Ledwidge and John M. High have formed a partnership under the firm name of Ledwidge & Co., and have opened a store at 238 Lake street, Chicago, for the sale of Tin-Plate, Sheet-Copper, Galvanized Iron, Black Irons, Solder, Sheet-Zinc and Tinners' Supplies generally. Mr. Ledwidge has hitherto been manager of the Chicago branch of Merchant & Co., of Philadelphia, his entire connection with that firm covering a period of six years. He is, therefore, fully conversant with the requirements of the trade in which he has now embarked as a principal, and also enjoys a wide acquaintance. His partner, Mr. High, has had experience also in the Chicago iron trade, acquired through a connection with some of the large firms of the city.

Batchellor & Sons Company, Wallingford, Vt., have received a cablegram from Paris announcing that a gold medal had been awarded for their exhibit of Agricultural Forks. The exhibit is arranged in the form of a pyramid about 15 feet in hight and includes Forks of every size and variety and has attracted much attention from the visitors to the exposition.

We are advised that A. B. Tripler is no longer connected with the Standard Oil Fuel Burner Company, 137 Broadway, New York.

In their striking advertisement on page 53 the John Pritzlaff Hardware Company, Milwaukee, Wis., call attention to their 1200-page catalogue, an especially interesting and satisfactory volume representing a very large line of goods. It is also stated that they will be pleased to send this catalogue to Hardware dealers with the first order for Shelf Goods amounting to $50, an opportunity of which many in the trade will doubtless avail themselves. An illustration of their extensive establishment will also be noticed.

The illustrations of Knitted Chains given on page 89 in the advertisement of W. C. Edge Company, 46 Green street, Newark, N. J., will be observed. These Chains made in brass and steel are put on the market in many different styles and are intended for Sash-Chains, Saddlery, Hardware trimmings, draperies, &c. The company have tips to fit on the ends of Chains when used for ornamental purposes and suitable fixtures for Sash-Chain in the various sizes. We are advised that the Chain has been used to a certain extent as a Sash-Chain and is referred to as having proved very satisfactory, running smoothly over the pulleys, while at the same time it is not liable to kink.

In his advertisement on page 46 Richard Thompson, 105 Chambers street, New York, calls attention, it will be observed, to the line of Wire Door-Mats, Wire Nails, Steel Shafting, Iron and Steel, &c., for which he is agent.

We are advised that Geo. C. Van Tuyl, of Albany, N. Y., for many years with the Hardware house of Corning & Co. and for the past three years with Maurice E. Viele, has severed his connection with the latter house.

Roscoe Bean, who for many years past was a member of the firms of Mast, Foos & Co. and the Tricycle Mfg. Company, Springfield, Ohio, has purchased an interest in the Superior Machine Company, of that city. The company have been engaged for a number of years in the manufacture of Iron Force and Lift Pumps at New Carlisle. Mr. Bean, in connection with J. V. Perrine, who has been with the company for a number of years, has assumed active charge of the business. The factory will be removed at once from New Carlise and established in the Simpson Building, West Main street, Springfield, which is referred to as a large and well-arranged factory building, admirably suited to their purposes. It is expected that the business of the company will be largely extended.

Trade Topics.

From a Pennsylvania Hardware house we have a letter in which they call attention to the neglect of some manufacturers and merchants to specify on their invoices the terms, and especially any discount that may be made for cash. Our correspondents say:

Allow us a small space for a few remarks on a subject which seemingly is of little importance, yet often occasions considerable trouble to book-keepers of both houses paying and receiving accounts. When a firm sends out a bill let them state plainly their terms, discount in 10 days, 30 days, &c. We receive a bill with no terms marked on it, remit for full amount, and afterward perhaps find that bill is subject to 5 per cent., 10 days. For the protection of those who take the advantage of cash discount every firm should be compelled to take a little trouble to secure prompt payment.

The Rodgers Trade-Mark.

Litigation in regard to the well-known trade-mark of Joseph Rodgers & Sons was recently decided in their favor. It was an action which they brought to restrain Albert Rottgen, a Cutlery manufacturer at Solingen, Germany, and Stahlecker & Co., his London agents, from infringing on their trade-mark. The statement of the case is given in the following extract from a report of the decision of Mr. Justice Kay:

It had also been proved that so long ago as 1764, in the fourth year of King George III, the Cutlers' Company at Sheffield granted to the plaintiffs' predecessors in title a corporate mark consisting of a star and cross. In September, 1877, the plaintiffs registered this mark in Germany and in May, 1876, they registered it in England. In September, 1876—that is, a year after the plaintiffs' German registration—the defendant Rottgen, or his predecessor in title, registered a mark in Germany consisting of, not a star and a cross, but two crosses, each having a considerable resemblance to the plaintiffs' cross. This action was brought to prevent the defendants from using an imitation of the plaintiffs' mark in England, the defendants being Albert Rottgen and Stahlecker & Co., who were Rottgen's agents in this country. The plaintiffs' case was that the defendants, for the purpose of their trade in India and other foreign countries, were not merely using their (the defendants') own mark and

name, but were also copying carefully the labels which the plaintiffs were in the habit of using for various goods which they sent to India and other countries. Comparing, for instance, the label used by the defendants for their Razor-Cases, his lordship held that it presented an identity with the label used by the plaintiffs which was remarkable. His lordship also held that there was similar identity of appearance both in design and letterpress in the case of the parcels of Pen-Knives. . . . . Having reviewed the rest of the evidence in the case, his lordship said he was convinced that there was a design on the part of the defendant, Rottgen, to avail himself of the similarity of his name to that of the plaintiffs' in order unfairly to attract to himself the plaintiffs' trade in countries where the English language was not well known

In view of the fraudulent imitation of the plaintiffs' trade-mark and the attempt to pass off Cutlery as made by them which was not theirs, the court, besides accepting an absolute undertaking from the defendants to discontinue the use of labels which were acknowledged to be an imitation of the Rodgers label, granted an injunction restraining the defendants and their agents from sending to England for sale or for shipment to India or to any other countries with which the plaintiffs had an established trade any Cutlery marked with the name of "Rottgen" and the double cross which the defendant Rottgen had adopted as a trade-mark, or any samples or show-cards with such name and mark, for the purpose of any such sale, the defendants to pay the costs of the action.

Trade.

From our correspondent in Louisville we have the following advices in regard to the condition of the Hardware business in that city:

The general trade of Louisville, Ky., continues in a most satisfactory condition, country orders being large and well assorted, and the jobbing-houses have all they can do to keep the shipping-rooms clear. In spite of large forces of clerks the goods pile up, and customers complain of delayed shipments. This is true of all lines, but particularly of the Hardware trade, and combined give the railroads all they can manage. The increase of rolling-stock of the railroads hardly keeps pace with the growth of the country's business. The terminal facilities of some of the roads entering the city are enormous, yet every day the freight-sheds are piled up full On two of our roads, one going South and the other East, the traffic averages 45 trains every 24 hours each. Collections are good, there being no reason why a country merchant should not be punctual, as the crop reports continue excellent

Bar-Iron keeps steady, there being a good demand from both mills and store, and if the former continue satisfied with present fair profits there is nothing to prevent a long season of profitable work The same is true of Sheet-Iron, but some uneasiness is felt in regard to Cut Nails, Wire Nails and Barbed Wire, the recent advances going perhaps further than occasion demands; those mills in turn say they are compelled to follow advances in Steel Billets and Slabs. The merchants prefer to see a stiff feeling in the manufacturers, but desire moderately good times to spurts in both directions. As predicted two weeks ago, Barb-Wire is now held at $3 50, Ohio River points. This is an advance of nearly 40 cents per 100 pounds in about three weeks. Cut Nails are now held by some mills at $2.10, f.o b. Wheeling, and Wire Nails at $2.40 and $2.50 at mills Some manufacturers contend that $2 rate for Cut Nails is high enough; that they can make some money at this price, and yet it is low enough to keep idle mills from standing, yet they have to name the outside figure to permit them to catch up with orders. Building in and around Louisville is remarkably brisk, many handsome structures going up and factories innumerable.

The Stove trade is surprisingly large, considering what a warm winter we had last season. dealers and foundries expecting to meet a surplus of stock carried over from last year.

We have also the following advices from the same point:

The Hardware business continues good, dealers having all they can well manage in filling orders. There was not such heavy buying by the jobbers this past week, both they and the manufacturers feeling alike good over the situation, the latter because of well-placed orders and the former because he sees a good profit and steady business ahead for several months. If prices will only hold and not be advanced beyond present figures on leading lines of goods this fall will chronicle an enormous and successful amount of business. Cut Nails, Wire Nails, Barbed Wire and Bar-Iron are now high enough, compared to the price on Pig-Iron. and as the mills are all making money, the dealers hope to see them for once pursue a conservative course. Wagon and Carriage Goods have gone out well, and the Hub and Spoke factories keep busy. The different factories around Louisville were never in better fix than at present—all lines of trade enjoying thriving business. This is particularly so of the machine-shops, bridge-shops and stove, grate and mantel foundries.

The tone of the market is reflected by the following circular which was recently sent out by Horton, Gilmore, McWilliams & Co., Chicago, Ill.:

All quotations and prices heretofore made on Cut and Wire Nails, Barbed Wire and Sheet-Iron are hereby withdrawn, and in future all prices will be subject to change without notice. The recent sharp advance in price of the above goods, with probability of further movement in the same direction, renders this action necessary. The advance in this market is not equal to the advance made at the mills, and present price in Chicago, both of Nails and Barbed Wire, is way below the factory price with freight added. This upward turn which has been forced by the advance in Pig-Iron has not yet affected the price of General Hardware.

Attracting Custom.

The following interesting remarks upon the subject of attracting custom recently appeared in the *American Grocer*, and while intended specially for the line of trade covered by that journal we have no doubt the suggestions will be found valuable by those engaged in the retail trade:

The main object with every merchant is, of course, to have a satisfactory number of profitable sales, otherwise whatever be the merits of his management the business is a failure. There are fewer and fewer cases in which a merchant has the monopoly of the trade from the remoteness of other stores. Wherever a good living is to be made some new aspirant starts up to divide it with the first occupant, and in most places competition is so rife that a pro rata division would be insufficient for a subsistence. In almost every case, therefore, the competitive struggle is for the survival of the fittest, and unless a tradesman understands and practices some of the legitimate arts which attract customers he is at a great disadvantage compared with those who possess and employ these means.

Every year sees a greater fertility of resource displayed by those who are competing for trade, and every year an increased number of persons reaching out for custom, instead of waiting for it to enter their doors. Many persons of conservative notions may object to the expedients to attract trade resorted to by younger and more energetic men, but it must be borne in mind that adaptation to circumstances is the law of success, that usages that do not violate right principles acquire a sanction after they have been taken up by the majority, and that our truest wisdom lies in conforming to them. For example, there was a time when few grocers advertised. One by one enterprising men took advantage of the local paper or sent out circulars as a means of informing the public of what they had to sell, and perhaps thus stealing a march on some competitor. Now almost every grocer advertises, and not to do so is to miss one of the best recognized means of drawing custom.

While there are means of attracting customers which are perfectly legitimate and commendable, there are others which are demoralizing, and which we would recommend no merchant to adopt, and if we can show a principle on which the dividing line may be drawn between the two classes it may assist many in pursuing a right policy. As a principle, we would say that whatever contributes to and helps regular, *bona-fide* business is to be commended, even though it be a new departure, while anything that conflicts with established business principles, however effective it may seem to be in bringing results, is not to be regarded favorably. To illustrate: A well-worded circular, calling attention to one's store and goods, sent round to every resident, may be a new departure in a place, but it directly aims to bring customers to make regular purchases, and is, therefore, an excellent idea. But the promise of a large chromo or a metal tea-pot to every purchaser of a pound of tea is a departure from legitimate business that we cannot approve of. A person who purchases an article is entitled to receive the best value that can be furnished for the money, after allowing a certain profit to the seller, and this does not admit of distributing other articles as gifts. Besides this, it encourages purchasers to look for that which they have no right to expect, and in practice we believe it is found to be attended with no permanent good result.

The same principle will be found to apply to the practice of cutting prices. In all cases where production is cheapened or transactions are conducted on such a scale as to popularize a commodity and it can be sold at a less price than formerly, the benefit is felt in the increased consumption, but where profit is placed below a living rate for the sake of inducing persons to patronize the store the action is hazardous, and if extended it must lead to bankruptcy. Where custom dictates that certain articles shall be sold at cost it is, perhaps, necessary to go with the tide, but this is no defense of the principle, which is manifestly a doubtful one. It is a bad principle to sell poor, indifferent, trashy goods because they can be offered at very low prices. Such goods it is against the interest of the public to buy at any price, and where a grocer fails to satisfy his customers in his attempt to sell cheap he is destroying all hold upon their confidence and their trade. To give indiscriminate credit is also very injudicious. It is sometimes done to ingratiate customers, but it is acting in defiance of all prudence, and it is no wonder—as in a notable instance described to us recently—that the career of merchants who pursue this policy is a short one.

Provided the plan does not conflict with good business principles, there is a field for all manner of devices for securing the preference of customers, and the ingenuity and enterprise of the merchant who takes the additional trouble deserve reward. The time is long past when a merchant could sit still and leave the public to wait upon him; he must be stirring, must offer good value at reasonable prices, and take pains to make the public aware of the fact. He must make himself popular by all the means that his good taste and good sense may suggest—a cleanly, attractive store, prompt and polite attendance, careful study of the wants and interest of customers. If there

are any legitimate means of advertising himself he should not neglect them. But it is well to discriminate between that which really helps the business and that which, like the gift system, or cutting prices, or loose credits, may afford a momentary stimulus, but loads a man down with burdens that he must either carry or disappoint the expectations created. No method is good that demands the surrender of self-respect. Cheap, flashy and tawdry methods of advertising, as by a profusion of red paint and colored lamps, make a man conspicuous rather than popular and really offend those who are most worth pleasing. That popularity is worth most which is built upon solid, sterling qualities, on people well served with good reliable articles for which they come again, and which they recommend to others. Such a reputation cannot be built up without much pains and knowledge, but if it cost the most it is worth the most; and all ways of making one's self popular and of drawing customers may well be shaped on this plan—of winning good-will, confidence and respect while pursuing purely legitimate methods in the conduct of the business.

Exports.

PER BARK BANN, SEPTEMBER 6, 1889, FOR SYDNEY, N. S W.

By Coombs, Crosby & Eddy.—108 pounds Twine, 32 dozen Handles, 2 Pumps, 1 dozen Saws, 9 Lamps, 2 Trucks, 10 dozen Shovels, 2 dozen Cages and Parts, 1 dozen Ladders, 3 dozen Wash-Boards, 8 dozen Axes, ½ dozen Lamps, 4 dozen Cow Bells, 1 case Broilers, Tool-Holders and Lemon-Squeezers, ½ dozen sets Irons, 30 dozen Shovels, 110 dozen Handles, 1 dozen Wringers, 12 dozen Handles, 9 dozen Axes, 84 Pumps, 15 dozen Edge Tools, 10 dozen Shovels, 164 dozen Hardware, 15 dozen Cow Bells, 13⅓ dozen Transom Lifters, 25½ dozen Saws, 7 dozen Well-Wheels, 6 dozen Wrenches, 38⅓ dozen Hardware, 12½ dozen Braces, 60 gross Screws, 24 dozen Hammers, 20 gross Shoe Polish, 42 Pumps, 4 dozen Wringers, 23 dozen Rakes, 59 dozen Hardware, 556 pounds Nails, 9 Scales, 30 Ladders, 6 dozen Irons and Handles, 20 dozen Axes, 6 Mowers, 12 dozen Wash-Boards, 18 Lawn-Mowers, 20 dozen Axes, 2 cases Cages and Parts, 2 cases Lemon-Squeezers and Glasses, 70 dozen Wire Goods, 19 1-6 gross Hardware, 4 Boring Machines, 1 gross Traps, 2 cases Hardware, 12 dozen Traps, 3 dozen Saws, 45 dozen Hardware, 1 gross Egg-Beaters, 60 dozen Slate.

By Arkell & Douglas.—1 case Axes, 2 packages Blocks, 1 case Hydraulic Rams, 10 barrels Wire, 54 packages Wash-Boards, 7 packages Barrows, 13 packages Stoves, 32 packages Hardware, 6 packages Pumps, 24 packages Hardware, 2 barrels Blocks, 1 case Hardware, 2 packages Plated-Ware, 9 cases Edge Tools, 1 box Hardware, 3 cases Handles, 1 barrel Lamps, 1 box Bolts, 2 cases Hardware, 72 packages Carriage-Ware, 16 cases Carriage-Ware, 5 cases Harness, 6 cases Bolts, 5 bundles Blacking, 7 packages Hardware, 1 Buggy, 31 packages Carriage-Ware, 48 cases Edge Tools, 13 crates Shellers, 27 cases Handles, 13 cases Nails, 30 dozen Shovels, 16 packages Hardware, 5 packages Lamp-Ware, 3 packages Drills, 2 packages Hose, 4 cases Feed-Cutters, 11 packages Pumps, 15 crates Churns, 1 case Ladders, 10 cases Edge Tools, 5 cases Plated-Ware, 3 cases Hardware.

By V. Basanta.—8 dozen Hammers, 1000 Wheels, 48 Velocipedes, 500 Axles, 2 dozen Wagons, 66 cases Fruit-Jars and Parts, 12 dozen Wash-Boards, 24 Meat-Choppers, 11 gross Fruit-Jars, 10 dozen Shovels, 50 dozen Handles, 4 dozen Step-Ladders, 2 dozen Wringers, 20 dozen Shovels, 62 dozen Saws, &c.; 7 dozen Plumbs and Levels, 1 dozen Saw Goods, 180 dozen School-Slates, 42 Velocipedes, 100 gross Paper Caps, 14 Perambulators, 6 packages Plated-Ware, 1 dozen Sad Irons, 12 dozen Braces.

By McLean Bros. & Rigg.—10 dozen Wrenches, 3 cases Hardware, 5 dozen Meat-Choppers, ½ dozen Fishing-Rods, 2 dozen Gauges, 1000 Handles, 36 dozen Machine-Oilers, 144 dozen Lead-Pencils, 75 packages Harrow Parts, 1 dozen Money-Drawers, 7 dozen Wrenches, 3 cases Hardware, 8 sets Axles, 6 dozen Axes, 5 cases Agate-Ware, 1 dozen Cork-Pullers, 1 case Drills, 3 dozen Bench-Stops, 36 dozen Machine-Oilers, 48 dozen Glue, 3 dozen Cork-Pullers, 5 dozen Braces, 12,700 Bolts, 224 pounds Whetstone, 19 dozen Hoes, 14 dozen Locks, 1000 Handles, 32 dozen Saws, 1064 dozen Handles, 2 packages Harrow Parts, 8 cases Hardware, 10 dozen Wrenches.

By Ilsley, Doubleday & Co.—12½ gross Axle-Grease, 6 dozen Brushes, 12½ gross Axle-Grease, 6083 feet Belting, 11,200 pounds Axle-Grease, 50 pounds Plumbago, 3 cases Hardware.

By Strong & Trowbridge.—4 dozen Wrenches, 16 dozen Axes, 12 packages Churns, 3 crates Step-Ladders, 5 cases Tools, 1 dozen Wringers and Parts, 3 packages Lamp-Ware, 1 package Lemon-Squeezers, 1 tierce Lamp Goods, 7 cases Hammers and Tools, 1 tierce Lamp Goods, 3 packages Gas-Pipe Joints, 2½ dozen Emery-Wheels, 9 cases Nails, 1 case Carriage-Springs, &c., 1 case Pulleys, 1 case Picture-Nails, 2 cases Castings, 30 dozen Handles, 3 cases Handles, 8 cases Nails, 10 dozen Shovels, 2½ dozen Emery-Wheels, 2 cases Tools.

By R. W. Forbes & Son.—3 cases Perambulators, 2 dozen Wringers, 3 boxes Perambulators, 5 packages Harness, 13 packages Hardware, 62 packages Wagons, 6 packages Agricultural Implements, 8 dozen Emery Wheels.

By W. E. Peck.—5 packages Hardware, 793 pounds Hardware, 3 cases Hardware, 1 case Plated-Ware, 8 packages Plated-Ware, 4 gross Fruit-Jars, 1 case Hardware, 36,500 Cartridges, 75,000 Primers, 2 cases Fire-Arms.

By F. B. Wheeler & Co.—3 cases Wagons, 48 dozen Handles, 7 cases Hardware, 4 cases Buggies, 30 packages Lamp-Ware, 1 box Hardware, 3 cases Wagons.

By Arnold, Cheney & Co.—16,093 pounds Axles, 2 cases Castings.

By Morris, Strouse & Co.—60 dozen Axe-Handles.

By McCoy & Sanders.—1 cases Iron Rivets, 2 bales Rubber Hose.

By A. S. Lascelles & Co.—2 packages Agricultural Implements, ½ dozen Vises, ⅛ dozen Saws, 10 dozen Axes.

By McLean Bros. & Rigg.—6 dozen Washboards, 1 case Hardware, 10 dozen Saws, 2 dozen Choppers, ¼ dozen Store Trucks, ½ dozen Stoves, 18 dozen Handles, 8 dozen Hammers, 4 dozen Axes, 24 dozen Hatchets

By Barden & Ackerman.—9 casks Plated-Ware.

By Welsh & Lea.—7 cases Iron Bolts.

By A. Field & Sons.—1804 pounds Tacks.

By G. W. Stetson & Co.—50 tons Pig-Iron.

By Rogers, Smith & Co.—5 packages Plated-Ware.

By Russell & Erwin Mfg. Company.—4 cases Hardware.

By Fairbanks & Co.—953 pounds Scales.

By Winchester Repeating Arms Company.—26,000 Cartridges, 65 Guns, 65 Tools, 100,000 Primers.

By A. Field & Sons.—9375 pounds Tacks.

By St. Louis Stamping Company. — 1968 pounds Granite-Ware.

By Healy & Earl.—4 cases Reaper Extras, 14 boxes Pumps, 1 box Saws, 6 cases Wood-Working Machinery.

By W. K. Freeman.—4 cases Hardware, 5834 pounds Axles, 133 pounds Hardware.

By Collins & Co.—330 dozen Tools.

By Lazarus & Rosenfeld.— 3 barrels Brass Cow-Bells, 1 case Rifles.

By Dunbar, Hobart & Co.—3360 pounds Nails.

By Simpson, Hall, Miller & Co.—3 packages Plated-Ware.

By J. L. Mott Iron Works.—2628 pounds Stoves and Parts.

By W. & B. Douglas.—4 packages Pumps.

By Edward Miller & Co.—21 packages Lamp Goods.

By R. W. Cameron & Co.—7 cases Hoisting Machinery, 1 case Saw-Mill Machinery, 2 cases Belting, 50 Tires, 1 Pump, 4 boxes Mill Machinery, 5 Stationary Engines, 4 boxes Drill Machinery.

PER BARK RUTH, SEPTEMBER 13, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By Coombs, Crosby & Eddy.—1½ dozen Hatchets, 3 Ladders, 202 packages Agricultural Implements, 15,000 pounds Nails, 150,000 Cartridges, 12,500 pounds Nails, 120 dozen Handles, 90 dozen Edge Tools, 5 Scales, 7764 pounds Sisal Rope, 36 dozen Handles, 24 Pumps, 24 dozen Forks, 23,409 pounds Wire, 100 dozen Edge Tools, 2 packages Pumps, 13 crates Stoves, 670 pounds Sisal Rope, 6 dozen Hardware, 20 Scales, 12 Ladders, 18 dozen Hammers, 6360 pounds Nails, 12 Plows, 10 dozen Picks, 24 Saws, 18 dozen Hammers.

PER SHIP ELWELL, SEPTEMBER 18, 1889, FOR MELBOUBNE, AUSTRALIA.

By W. K. Freeman.—1436 pounds Hardware, 13 cases Hardware, 15,000 pounds Handles.

By Reed & Barton.—487 pounds Silver-Plated Ware.

By V. Basanta.—5 dozen Saw Goods, 8 dozen Axes, 2100 pounds Broom-Wire.

By Geo. W. Stetson & Co.—50 tons Pig-Iron.

By M. R. Gildersleeve & Co.—7 cases Plated-Ware.

By Russell & Erwin Mfg. Company.—7 cases Hardware.

By Reed & Barton.—155 pounds Silver-Plated Ware.

By Rand Drill Company.—1 barrel Wire-Fuses, 21 boxes Drill-Machinery.

By Healy & Earl.—1 Thresher, 19 cases Wood-Working Machinery.

By R. W. Forbes & Son.—2 cases Hardware, 5 boxes Hardware, 3 dozen Rat-Traps, 3 cases Skates, 1 case Skates, 1 package Hardware, 4 cases Electric Goods, 9 cases Hardware, 1 barrel Glue, 17 cases Hardware.

By Ilsley, Doubleday & Co.—2240 pounds Axle-Grease, 6¼ gross Axle-Grease, 3900 pounds Hardware.

By Crane & McMahon.—22 cases Hardware.

By Meriden Britannia Company.—3 packages Silver-Plated Ware.

By Joseph Dixon Crucible Company.—209 pounds Lead-Pencils.

By Arkell & Douglas.—1 case Hardware, cases Carriage-Ware, 1 case Meat-Choppers, 1 case Fishing-Rods, 4 cases Horse Nails, 1 case Castings, 115 packages Carriage-Ware, 61 bundles Steel, 10 packages Lamp-Ware, 3 packages Pumps, 1 box Rakes, 3 boxes Hardware, 8 crates Traps, 1 case Hardware, 4 cases Trucks, 2 cases Locks, 4 cases Trucks, 19 packages Hardware, 70 boxes Axes, 13 cases Handles, 76 packages Carriage-Ware, 10 packages Pumps, 3 crates Ladders, 5 cases Oil Stoves, 65 packages Hardware.

By Alfred Field & Co.—370 pounds Nails, 5 dozen Tools, 6 dozen Saws, 3 dozen Tools, 30 gross Pencils, 5 packages Carriage-Ware, 56,000 pounds Bolts, 62 pounds Nails, 1050 pounds Iron, 100 dozen Whip-Handles, 12 dozen Axle-Grease, 1 gross Axle-Grease, 12 dozen Tools, 3 gross Whips, 610 pounds Iron, 6 dozen Carriage-Ware, 25 dozen Hardware, 340 sets Axle-Boxes, 42 sets Axle-Springs, 38,000 Bolts, 6300 Spokes.

By R. W. Cameron & Co.— 36 bundles Handles, 10 boxes Hardware, 1 case Saw-Mill Machinery, 11 cases Wagons, 2 cases Hardware, 2 Carpet-Sweepers, 1 case Brushes, 12 cases Velocipedes, 144 cases Handles, 50 tons Iron.

By W. H. Crossman & Bro.—1½ dozen Perambulators, 708 dozen Handles, 7½ dozen Fruit-Jars, 13⅓ gross Fruit-Jars, 1½ gross Spoons, 2 cases Lamp Goods, 4 cases Hardware, 7 cases Agricultural Implements, 6 cases Hardware, 2 dozen Store-Trucks, 3 dozen Rakes, 4 dozen Latches, 1 dozen Cutters, 5 gross Axle-Grease, 24 dozen Handles, 18 dozen Hatchets, 24 dozen Locks, 12 dozen Wrenches, 4 dozen Pumps, 7½ dozen Fruit-Jars, 2 dozen Banks, 2 cases Hardware, 6 gross Forks, 18 dozen Hammers, 3 cases Axes, 7½ dozen Fruit-Jars, 45 dozen Hay-Forks, 44 dozen Axes, 5 dozen Braces, 69 packages Stove Parts, 4 packages Hardware, 6 dozen Bench-Screws, 2 cases Hog-Rings, 30 packages Hardware, 15 Pumps, 4 dozen Brushes, 1 dozen Banks, 23 dozen Iron Locks, 7½ dozen Hardware, 4 packages Plated-Ware, 6¼ dozen Braces, 3 gross Polish, 10 cases Hardware, 54 pounds Tacks, 35 dozen Wash-Boards, 116 dozen Axes, 7½ gross Axle-Grease, 5 packages Pumps and Parts, 19 dozen Screw-Drivers, 30 dozen Braces, 64 dozen Burners, 69 dozen Wringers, 4 dozen Saw-Sets, 4 dozen Stencils, 24 dozen Lamp-Burners, 12 dozen Hammers, 1500 feet Hose, 6 dozen Bench-Screws, 62 dozen Hatchets, 1 barrel Hose, 32 packages Hardware, 3 dozen Wrenches, 1 gross Mouse-Traps, 7½ dozen Fruit-Jars, 5 cases Hardware, 11 cases School Crayons.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Animal and Vegetable Oils.

There has been a rather better movement of the leading goods in this line, Cotton-Seed-Oils excepted. Various rumors of unfavorable character growing out of the break in prices for American Cotton-Oil Trust certificates have acted as a restraint upon buyers' operations in the Oils, but prices for the products are now down to so low a level that any further considerable decline is hardly probable. Contrasting with the above, the movement of Lard-Oil prices has been upward and full

previous figures for Linseed-Oil are maintained, enhanced cost of raw material, together with sagacious policy on the part of manufacturers, having produced good results. The higher prices for Lard-Oil in turn have served to help the market for other lubricants in some degree. The reports from the fishing show that the Menhaden catch has continued light and the Oil products are consequently firmly held. With respect to the balance of the list there is nothing specially new to report for the week.

Linseed-Oil.—There has been a very steady movement of city-made Oil at firm prices and the moderate supply of outside product has found outlet also at last week's figures. The position of the seed market, along with the good trade in the Oil, serves to keep matters in strong position and there are no indications whatever of any reverse turn in the immediate future.

Lard-Oil.—City-pressed Oil is 2¢ ℔ gallon higher and very firm at the advance. The popular brands are now generally held at 56¢ and 55¢ is a positively inside rate. Out-of-town brands are held at the latter price, as a rule, and 54¢ is the lowest possible figure for the least popular brands. There has been a very good demand throughout the week.

Cotton-Seed-Oils.—While comparatively the lowest of anything on the list Cotton-Seed Oils seem to be the weakest and the most difficult to sell. Crude has been let go at 31¢, and would not bring over 30¢ in round lots at the present time. On Summer Yellow 39¢ has become an extreme price, and 37¢ @ 38¢ the best figures for ordinary quality. The export demand is slow, and the home trade buying shows no improvement.

Menhaden Oils.—Crude is firm at prices on the basis of 21¢ @ 22¢ for common and 23¢ @ 23½¢ for best qualities. The demand has continued fair, but the strength of the market is due chiefly to the fact that the catch of fish has continued small. For Pressed and Bleached Menhaden and Tanners' Oils there continues to be a firm and fairly active market.

Sperm and Whale Oils.—Crude Sperm is firmer at 62¢ in the East, and in very fair demand. Of crude Whale about 300 barrels have been sold on p. t. The manufactured products have met with fairly active sale at about previous prices.

Olive-Oil.—Italian, in barrels, has remained firm at 72¢ @ 73¢ for spot lots, but continues rather slow, although the foreign cost is 3¢ @ 5¢ above the figures named.

Cocoanut-Oils have remained quite firm at last week's prices, but rather slow.

Red Western Elain-Oil has been sold at 4½¢ @ 4⅝¢ to the extent of 300 barrels. For choice city brands 4¾¢ @ 5¢ is quoted.

Paints and Colors.

There has been a rather better market for most pigments and the more staple lines of Colors. The local demand has improved considerably, owing in part to more favorable weather and consequent rush of out-door work. Orders from near-by out-of-town points have been more numerous, as have also those from distant quarters, while some increase in the size of purchases, as well as in the number, is recorded in several instances. The movement of goods, however, does not appear to be greater than usual for this period of the year, and buyers experience no difficulty in securing all necessary supplies at old prices. Competition keeps within reasonable bounds throughout and the market shows fairly good tone.

White Lead.—Sales have been more extensive in volume and the market has shown a greater degree of spirit the last few days, yet quite numerous orders have been received from out of town, besides much freer purchases for local and near-by accounts. In point of fact there is a good seasonable trade at the present time. Jobbers' stocks have run down to a low point, and the lowest net prices accepted a short time ago are not duplicated in any quarter. The manufacturers, being now nearly all in the trust, adhere firmly to the official prices and rebates in detail.

Zincs.—The demand for American Oxide has improved somewhat and the volume of business is nearer to the full average volume for the season than at any previous time since early September. Supplies are moderate in first hands and prices remain very steady. For foreign Zincs there is about the average call and prices for all grades are firmly held.

Red Lead and Litharge.—For these goods the demand has improved somewhat, without, however, showing particular spirit, and prices remain very steady.

Orange Mineral.—Foreign is rather firmer, with a slight advance on previous lowest prices paid for some brands, the demand being fairly active and the importation moderate. Domestic is steady and meeting with rather better sale.

Colors.—Dry Colors, while not particularly brisk, have been moving more freely than during the previous week, and there is a better tone to the market, although no quotable change in prices. Venetian Red, Ochers, Browns and standard Greens for painters' use have fared noticeably well. Paris Green and "insecticides" were rather slow, the Southern demand having slackened off.

Miscellaneous.—Sales of Whiting and Paris White have increased and the market for those goods is firmer, but prices show no quotable change. Clays generally are steady at previous prices, but in merely fair demand.

Trade Notes.

The Standard White Lead Company, New York, have been delayed somewhat by difficulties in getting their machinery in smooth working order, but will very probably have their new process White Lead upon the market before the close of the month. The Standard is an anti-trust concern.

Wholesale Prices.

NEW YORK, October 9, 1889.

Animal and Vegetable Oils.

Linseed, City, raw	per gal	60 @	..
" " boiled		63 @	..
" Western, raw		.. @	58
Lard, City, Extra Winter		57 @	..
" " Prime, present make		55 @	56
" " Extra No. 1		45 @	48
" " No. 1		38 @	42
" Western, prime		54 @	55
Cotton-seed, Crude, prime		31 @	32
" " off grades		29 @	30
" Summer Yellow, prime		39 @	40
" " " off grades		37 @	38
Sperm, Crude		.. @	62
" Natural Spring		67 @	68
" Bleached Spring		72 @	73
" Natural Winter		74 @	75
" Bleached Winter		80 @	..
Whale, Crude		38 @	40
" Natural Winter		45 @	..
" Bleached Winter		47 @	..
" Extra Bleached		49 @	..
Sea Elephant, Bleached Winter		54 @	55
Menhaden, Crude, Sound		21 @	23
" Crude, Southern		21 @	23
" Light Pressed		28 @	29
" Bleached Winter		34 @	..
" Extra Bleached		38 @	39
Tallow, City, prime		.. @	50
" Western, prime		.. @	47
Cocoanut, Ceylon		5⅝ @	5¾
" Cochin		.. @	6⅛
Cod, Domestic		31 @	32
" Foreign		34 @	35
Red Elaine		36 @	38
Red Saponified	℔	4½ @	5
Bank	per gal	25 @	26
Straits		27 @	28
Olive, Italian, bbls		72 @	73
Neatsfoot, prime		62½ @	75
Palm, prime, Lagos	℔	.. @	5¾

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test	per gal	8 @	9
" " 15 "	"	8½ @	9½
" " summer	"	6 @	7
Cylinder, light, filtered	"	15 @	20
" dark, "	"	14 @	20
" " steam refined	"	10 @	18
Paraffine, 23½ @ 24 gravity	"	11 @	12
" 25 "	"	10 @	11
" 28 "	"	8½ @	9
" red, 21 @ 22 gravity	"	14 @	14½
" 22½ @ 23 "	"	12 @	13

Paints and Colors.

Barytes, Prime White	℔ ton.	$21.00 @	21.50
" American Refined		18.00 @	20.00
" " No. 1		16.00 @	17.00
" " No. 2		14.00 @	15.00
" " off-color		12.00 @	.....
Blue, Celestial	℔	5½ @	7½
" Chinese		45 @	50
" Prussian		20 @	35
" Ultramarine		7 @	25
Brown, Spanish		½ @	1
" Vandyke, American		3 @	3½
" " English		6 @	8
Black, American Drop		8 @	10
" English "		12 @	14
" Frankfort "		5 @	18
Black, Lamp, common		12 @	18
" " medium		19 @	25
" " prime		27 @	33
Carmine, No. 40, in bulk		3.10 @	..
" " in boxes or barrels		3.20 @	..
" " in ounce bottles		4.20 @	..
Chalk, in bulk	℔ ton.	..... @	2.00
" in bbls	℔ 100 ℔	30 @	40
China Clay, English	℔ ton.	13.50 @	18
" Southern		10.00 @	11.50
Cobalt Oxide, prep'd		2.90 @	..
" " black	lots 100 ℔	2.60 @	..
" " "	less "	2.65 @	..
Crocus Martus, English	℔ ℔.	1½ @	2½
" American		1½ @	2½
Green, Paris, in bulk		20 @	..
" " 170 @ 175 ℔ kegs		20½ @	..
" " small packages		22 @	26½
" Chrome, ordinary		8 @	11
" " extra		12 @	13
" " pure		22 @	25

REBATES, &c.—Paris Green.—Rebates to buyers of 500 to 1000 ℔ during season, ½¢ ℔; to buyers of 1000 to 2000 ℔, 1¢; to buyers of 2000 to 4000 ℔, 1½¢; to buyers of 4000 to 10,000 ℔, 2¢, to buyers of 10,000 ℔ and over 2½¢. Buyers of 5 tons or over at one time receive an additional ¼¢ ℔.

Lead, American White, dry		6¾ @	7
" " in oil		7 @	7¼
" " Red		6¾ @	7
Litharge, in barrels		6¼ @	.
" " 500-℔ lots		7 @	..
" " smaller "		7¼ @	..

REBATES, &c.—White Lead. ½¢ ℔ ℔ rebate on purchases of 500 ℔ and over, if paid for within 60 days of date of invoice; terms 60 days or a discount of 2½ % if payment within 15 days from date of invoice. Extra rebate of ½¢ ℔ ℔, payable July 1 and December 31 to buyers of a total of 10 tons pure Lead during the year.

Litharge.—Rebate of ½¢ ℔ ℔ for cash in 60 days and 2½ % additional for cash in 15 days.

Ocher, Rochelle		1.35 @	1½
" French Washed		1½ @	2½
" German Washed		1½ @	3
" American		½ @	1¼
Orange Mineral, English		8½ @	9½
" French		9 @	9¾
" German		8½ @	9½
" American		8 @	8½
Paris White, English Cliffstone		90 @	1.10
" American		70 @	80
Red, Indian, English		5½ @	7
" " American		2 @	6
" Turkey		9 @	14
" Tuscan		9 @	11
" Venetian, American	℔ 100 ℔.	90 @	1.25
" " English		1.00 @	1.45
Sienna, Italian, Burnt and Powd.	℔	5 @	6½
" " Burnt Lumps		1¼ @	3½
" " Raw, Powdered		5 @	6½
" " Lumps		2 @	3½
" American, Raw		1½ @	1¾
" " Burnt and Powdered		1¾ @	1¾
Talc, French		1¾ @	1¾
" American		1 @	1¼
Terra Alba, French	per 100 lb	72½ @	80
" English		80 @	85
" American No. 1		70 @	75
" American No. 2		38 @	40
Umber, Turkey, Bnt. and Powd.	℔	3½ @	4
" Burnt, Lumps		2¾ @	3
" Raw and Powdered		3½ @	4
" Raw, Lumps		2½ @	2¾
" Burnt, American		1¾ @	1¾
" Raw, "		1¾ @	1¾
Yellow, Chrome		10 @	25
Vermilion, American, Lead		11½ @	13
" Quicksilver		65 @	70
" English Imported		82 @	85
" Imitation English		8 @	25
" Trieste		75 @	77
" Chinese		88 @	90
Whiting, Common	℔ 100 ℔	40 @	45
" Gilders'		55 @	65
Zinc, American, dry	℔ ℔	4¼ @	4¾
" French, Red Seal		.. @	7½
" " Green Seal		.. @	7½
" " V. M. X		6 @	6¼
" Antwerp, Red Seal		.. @	7
" " Green Seal		.. @	7¼
" German, L. Z. O		.. @	6
" V M. in Poppy Oil, G. Seal, lots of 1 ton and over		10 @	10½
lots less than 1 ton		10¼ @	10¾
Zinc, V. M. in Poppy Oil, Red Seal, lots of 1 ton and over		9¼ @	9¾
Lots of less than 1 ton		9½ @	10

DISCOUNTS.—French Zinc.—Discounts to buyers of 10-bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Blue, Chinese	℔ ℔	35 @	40
" Prussian		20 @	45
" Ultramarine		12 @	18
Brown, Vandyke		7 @	12
Green, Chrome		8 @	13
" Paris		16 @	18½
Sienna, Raw		7 @	13
" Burnt		7 @	13
Umber, Raw		7 @	10
" Burnt		7 @	10

Glue.

Low Grade	℔ ℔	8 @	10
Cabinet		12 @	14
Medium White		13 @	15
Extra "		17 @	20
French		9 @	20
English		10 @	15
Irish		12 @	15

It is calculated that vessels will be completed on the lakes this year with a carrying capacity of about 107,000 gross tons. Of this total Cleveland is expected to build 33,000 tons, or nearly one-third.

The Sexton Pipe-Closer.

With the extending application of tests to cast-iron soil-pipe several devices for stopping the pipes have been brought out. One of the latest is the invention of Michael Sexton, 1112 Third avenue, New York City, who is manufacturing the apparatus and offering it to the trade. In Fig. 1 we show a general view of the closer as applied to a cast-iron soil-pipe; Fig. 2 shows the device separate, while Fig. 3 illustrates the collar used in applying the closer to the spigot end of the pipe. Through the center of the cross-bar of the frame a bolt with a square head passes, and the lower end of the bolt has a washer turned on it which fits in a slot in the middle of the cover or stopper. By means of an iron wedge at the side, as shown in Fig. 1, the end of the bolt is kept in position. On the lower side of the cover is an annular flange, outside of which is a rubber gasket. To stop the hub end of a pipe the jaws are caught over the hub, the cover adjusted to the end of the pipe, and by means of a wrench it is screwed down till the rubber gasket forms a tight joint. Some of the covers are provided with a hole into which a cock is screwed for applying the test. The hole for the reception of the cock is shown in the cover in Fig. 1. Where applied to the spigot end the pipe is embraced with the collar (Fig. 3), which serves the purpose of a hub for supporting the frame of the closer. The application is simple, as the collar consists of semi-circular straps held together by bolts passing through lugs at the ends. The manufacturer alludes to the fact that this collar can furthermore be used as a hanger for either vertical or horizontal pipes. It is also useful to grasp or support any size pipes away from the hub. The Sexton Pipe-Closer is made in five sizes, from 2 to 6 inches in diameter.

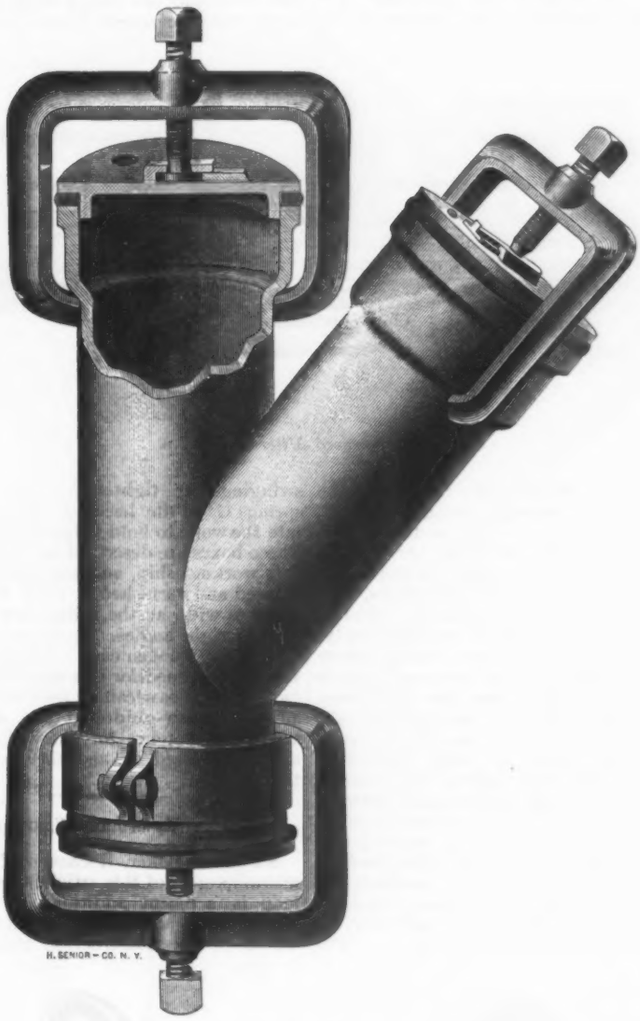


Fig. 1.—The Sexton Pipe-Closer Applied to Pipe.

Fig. 2.—Closer Detached.

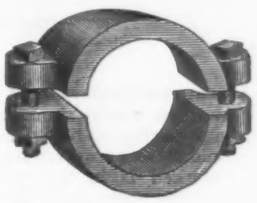


Fig. 3.—Collar.

The Metropolitan Water-Waste Detector.

A few years ago Mr. B. S. Church, who was chief engineer of the New York Aqueduct, devised simple means for detecting the waste or leakage of water. The apparatus, known as the Metropolitan Water-Waste Detector, is being brought into use by C. H. Roosevelt, 48 Exchange place, New York. We take the following description from a little pamphlet recently issued by Mr. Roosevelt.

It consists of a cock and hollow stem, to be placed in the sidewalk in front of each house as a permanent fixture, attached to the ordinary stop-cock now in use, on a by-pass, the plug of which is so constructed that on being turned to certain positions the static and dynamic pressures can be ascertained, the difference between those pressures demonstrating the quantity of water flowing at any time of inspection. The manner of inspection is as follows:

The inspector is to carry with him a pressure-gauge when he makes his rounds for examination between the hours of 12 o'clock at night and 4 o'clock in the morning. The gauge is so made that it can be screwed upon the top of the stem that leads from the cock, so that no air can escape from the stem. He also carries a key with which to close the stop-cock, and having done so he then attaches the pressure-gauge to the hollow stem. Having secured the gauge to the stem the inspector is to turn the gauge, stem and plug of the cock to a position where the water is shut off from the house, and a small port in the plug which connects with the hollow stem is brought to a position on the side of the inlet and street main, so that the static pressure in the main pipe bears upon the atmosphere in the stem of the cock and gauge, causing the hand upon the face of the gauge to rise to the maximum pressure. The inspector then turns the gauge stem and plug, so that another port is opened, permitting the water to flow through, if there be any outflow from the pipes in the house, and thus relieving the pressure upon the gauge to an amount equal to the quantity of water flowing. The difference between the static and dynamic pressure indicates the rate or quantity of water flowing.

Parts of the Detector.

It must be readily seen that if there is no water flowing in the house at the time of inspection the static pressure will be fully maintained, and that the least outflow must diminish such pressure. The inspector having taken the record passes to the next house. By repeated experiments it has been found that this method

will reveal the least leakage, even the size of a pin-hole. By this system the great difficulty in fixing the location of waste by defective plumbing and careless use, except by personal inspection inside of houses, is obviated, and the city authorities are given complete control. The inspector then turns the stem to position third, at which the pressure from the street is shut off and the pressure from the house only bears upon the gauge, which pressure will remain constant if there be no leak, but if there be a leak the pressure will be diminishing while the flow lasts and until the water in the pipes descends to a level with the leak, and the pressure that remains when the hand of the gauge comes to a stand shows the location of the leak, whether above or below the stop-cock, and the number of feet either way.

The Ferret Animal-Trap.

This article, which is represented in the accompanying illustrations, is manufactured by J. R. Schuyler & Co., Bloomsburg, Pa. Fig. 1 shows the trap set and ready for use and Fig. 2 closed for packing or carrying. The base of the trap is made of malleable iron and the wire-work coppered steel spring wire. The manner of setting the trap will be gained by an inspection of Fig. 1. The back wire supporting the bail works on a hinge and springs into the beveled slot in the base.

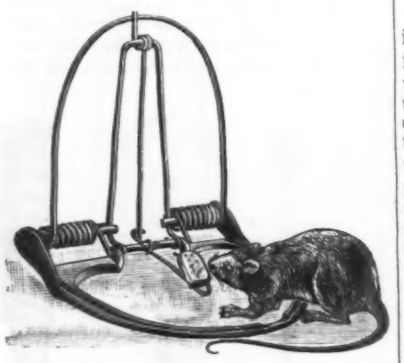


Fig. 1.—The Ferret Animal-Trap, Set.

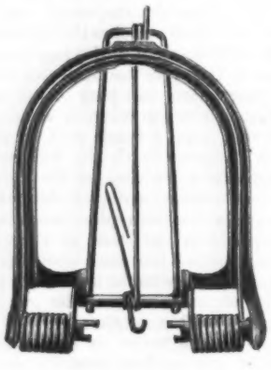
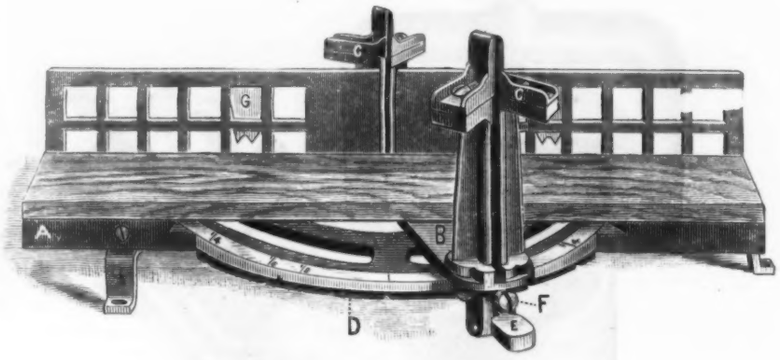


Fig. 2.—The Ferret Animal-Trap, Closed.

The lightest touch springs the trap, from which there is no chance of escape, and being constructed solely of metal it retains no smell of killed animals to warn the wary rodent. It is claimed that the trap will not rust, warp, split or get out of order, like the wood-bottom traps. The manufacturers refer to the compactness with which the goods may be packed and shipped. They are put on the market as especially efficient in catching rats.

Olmsted's Improved Miter-Box No. 6.

L. H. Olmsted, Corona, N. J., has recently added to his assortment of miter-boxes the one which is represented in the accompanying illustration, which, it will be observed, possesses new features. It is constructed entirely of iron and steel, and a board is secured to the bottom of the inside to place the work upon. To the frame A is attached a swinging-bar, B, which swings on a pivot at the back of the frame. This swinging-bar is constructed with four uprights; to the top of these uprights is attached four irons, C C, which serve as guides for the saw. The two right-hand irons are fastened permanently; the two other irons are slotted where the screws pass through them and can be moved up to and from the fixed irons, thereby adjusting the space between the irons to fit any thickness of saw-blade. These saw-guides are made sufficiently high and broad to make a good bearing upon the saw-blade, and the space between them being open only sufficient to allow the saw to move freely, it is assured that perfect work can be done with this box, for the saw will be held in a perfectly upright position and an ordinary cross-cut saw can be used as well as a back saw, for the blade cannot spring in this box. The saw-guides are for the purpose of preventing the saw from coming in contact with the slots in the swinging-bar. Underneath the frame and in front are seven segments of a circle, marked D in the illustration. Each one of these segments is notched and made fast to the frame by screws. The holes through which these screws pass are elongated to allow the segments to be moved latterly. Attached to the swinging-bar B is a lever, E, which moves freely in two slots, one end being secured by a pivot, and is actuated by a steel spring; this lever is fitted to the notches in the segments, and by moving the swinging-bar the lever will be sprung into either of the notches desired and thereby hold it fast. These segments with notches are adjusted to an absolutely true gauge, to hold the saw-guides at the angle indicated by figures and marks on the frame over each notch, which are right angle, one-eighth, one-sixth, one-fourth, and are easily readjusted if desired by loosening the screws. To saw at other angles than those indicated by the notches, the saw-guides are placed at the angle desired and the screw F at front end of swinging-bar tightened. The pointed springs G on the back are used to press into the work to hold it fast while sawing. These boxes are described as made in the best workmanship, and are well finished, painted and varnished. They will work 4 inches wide at the miter and 6 inches wide at right angles. Each box is packed in a strong wooden case. Among the advantages claimed for this miter-box is the fact that any saw can be used in it, as the adjustable saw-guides fit any saw. The adjustable notches for the various angles are also referred to, and the accuracy of the box.



Olmsted's Improved Miter-Box No. 6.

Security Hames Fastener.

Stewart & Baker, Rochester, N. Y., are manufacturers of this article, to which the loop is a recent addition. It is represented in the accompanying illustrations, which show its construction and indicate the manner of its use. The lever is referred to as making it easy to draw the hames tight into the groove of the collar, holding them firmly and preventing possible injury to the horse from loose hames. The tension secured by this fastener is stated to be greater than that obtained with the usual strap. The spring, which is a flat piece of steel, holds the lever securely locked, preventing its accidentally opening. The hooked piece is constructed as shown in conjunction with the back piece or fastener, so that it cannot be dropped out until the lever is detached from the spring. The fasteners are made with a varying number of adjustments, as they have four, five or six hooks. The hinge is made by a new process, and is referred to as stronger than can be made with

The Security Hames-Fastener.

rivets or any other way. Among the advantages to which the manufacturers call attention as possessed by this fastener are: The saving of time, the security of the fastening, the fact that it fits exactly the shape of the collar, giving a finish to the harness, and that while it cannot be accidentally unlocked it can be instantly unlocked when desired.

Rawhide-Bound Mallets.

C. E. Jennings & Co., 79 and 81 Reade street, New York, are putting on the market, as sole agents for the manufacturers,

Fig. 1.—Rawhide Bound Mallet.

a line of rawhide-bound mallets and chisel-handles, which are represented in the accompanying illustrations. It will be perceived that the rawhide entirely covers the faces of the mallet, and that in the chisel handles it is similarly applied to the ends of the handle, and also, as in Fig. 2, forming a ferrule. This construction of the mallets from the spring of the hide is referred to as cushioning the blow and preventing jarring, thus greatly relieving the arm of the user, and this is referred to as especially the case when used in connection with a rawhide-bound chisel-handle. The smoothness of the mallet face and durability of the rawhide are other points that are made in connection with it. The mallet is made with a 2½-inch face and the chisel-handles are made of assorted sizes, both for tanged tinners and for socket firmer and framing chisels.

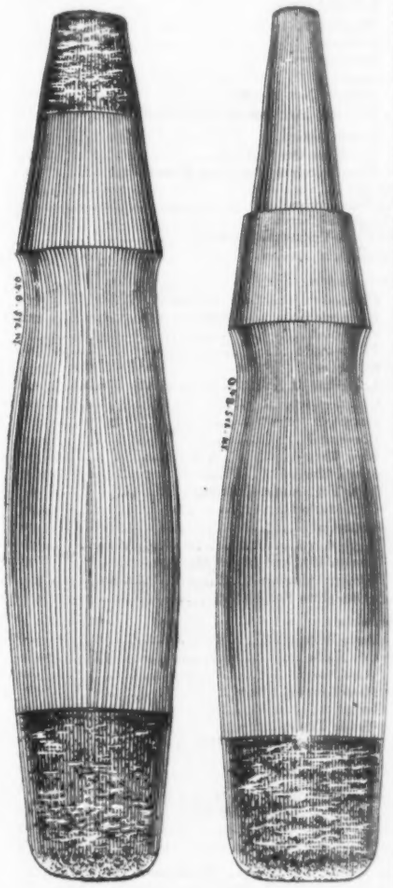


Fig. 2. *Fig. 3.*

Rawhide-Bound Chisel-Handles.

New Vises.

Vanderman's Patent Hinged Self-Locking Steel Vise is shown in Fig. 1. In the left-hand cut the device is shown closed, while in the right-hand cut it is open. The frame is made entirely of steel and the jaws of best tool-steel, and can be readily removed for repairs or duplication. The method of using the device will be clearly understood by inspecting the engraving.

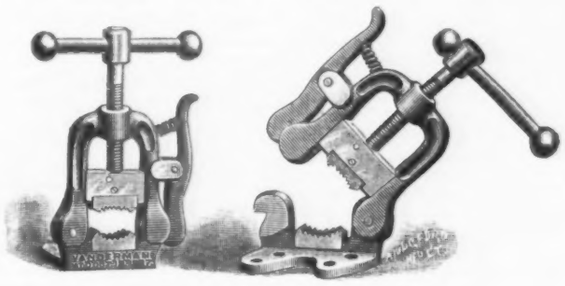


Fig. 1.—Hinged Self-Locking Steel Vise.

In Fig. 2 we illustrate Vanderman's Patent Improved Combination Pipe-Vise, while one of the removable jaws is shown in Fig. 3. The sliding bars, screws, handles and jaws are made of steel and are said to have stood the severest tests.

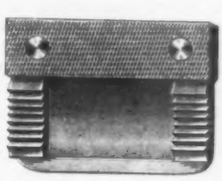


Fig. 3.—Removable Jaw.

Among the special merits claimed for this tool are a large number of friction points and increased holding capacity. The pipe-jaws, furthermore, may be instantly removed, reversed or repaired, and they do not interfere with the use of common jaws, besides materially assisting in holding irregular-shaped bodies The device is solidly constructed and is provided with an anvil for hammering pipes, fittings, &c., while the groove on the upper part of rear jaw-frame is useful for straightening or bending pipe. A new feature, to which attention is directed, is the bushing, which may be instantly attached to the device for forming half and quarter turns and offsets. The device is made in two styles and will take pipe from ⅛ inch to 7 inches. They are put on the market by Wm. Vanderman, Willimantic, Conn.

Combination Store-Truck.

Messrs. S. C. Tatum & Co., Cincinnati, Ohio, are placing upon the market Tatum's Combination Store-Truck, illustrated by means of the accompanying engraving. This truck is made of solid hard-wood board from selected lumber, constituting the body proper, with steel axle and chilled nose. The nose and axle carriages are securely bolted together, the body-board intervening, and the axle is formed of one piece running through from outside to outside. The manufacturers claim for this truck that it is much more convenient than many of more expensive construction and that it is always handy and never in the way.

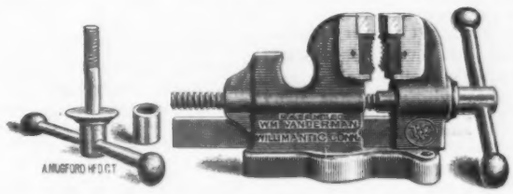


Fig. 2.—Combination Pipe-Vise.

The formal opening of the great steel draw-bridge across the Thames River at New London, Conn., will take place this week. Trains will start simultaneously from New York and Boston, conveying invited guests, including prominent engineers, mayors of cities, &c.

Tatum's Combination Store-Truck.

The Field Guns.

At a recent exhibition at Melbourne an interesting exhibit was made of the guns of Alfred Field & Co., Birmingham, England, and 93 Chambers street, New York. Of these guns the following description is given in the *British Journal of Commerce:*

Of their productions, the Field Useful Gun is exceedingly valuable. For years the firm have devoted the utmost thought and experience to its development, and it now contains all their latest improvements, with first-class workmanship throughout, without any waste of money in engraving or unnecessary embellishments, which form so important an item in the price of expensive guns. The solid bar action is a special feature in this gun, especially for markets where a light gun is required. All the working parts of the lock being at the back end enables the action to be left equally as strong as on a much heavier gun. One of these guns, taken from bulk, was shot with 2000 times, and it remained as tight and sound as a new gun. Their Double-Breech-Loading Hammer Gun, with Scott top-lever, has five grips (side wings), solid bar horseshoe bridle, steel rebounding-locks, best English Damascus barrels, shell fence, skeleton heel-plate, sunk tumbler-pins and screwed body-pin. There are no lumps through the body, and it is finished entirely in the best possible manner. It is fitted with Anson's patent fore-end, and has a fine figured stock, with bottle points, pistol-grip, short strap break-off, and fully and finely engraved. The Anson-Deeley Patent Action Hammerless Breech-Loading Double Gun is very much admired and extensively used. It is very fully scroll-engraved and has curly Damascus barrels and Greener's treble wedge-fast cross-bolt, with side wings. It has also Anson's patent fore-end fastener, bottle points, pistol-grip, sunk panels, engine-turned rib and steel toe and heel plate. The stock is in fine figured-heart walnut, and the finish of the weapon is first-rate at all points.

We are advised that Alfred Field & Co., 93 Chambers street, New York, are intending to push these guns energetically, expecting that they will meet fully the requirements of this market.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., October 8, 1889.

The Washington Navy Yard, which since the old-time war-ships passed out of date has been practically deserted, is to-day a scene of warlike industry. The antiquated ship-houses which still stand as memories of a past age of ship-building are filled with great masses of crude and unfashioned material for modern armaments, and the buildings not long ago used for naval stores have been remodeled and extended for the great plant of the National Gun Foundry established here by Congress in 1885. So quietly has this wonderful transformation been made that the American people in general, and even the toilers of metallurgical industries and skilled artisans in the manipulation of immense machine tools, know but little of the great Government works which are now nearing completion for the fabrication of modern high-power breech-loading guns. Over 1200 men, skilled machinists and laborers in the different branches of gun-making, are now on the rolls of the gun foundry turning out the best guns in the world and receiving upward of $60,000 in wages per month.

The rapid development of these great gun-works is due to the practical skill and administrative ability of Captain William M. Folger. Captain Folger has had 28 years' experience in the naval service. He is a member of the American Society of Mechanical Engineers and of the English Institute of Mechanical Engineers.

The organization of the works is upon strictly industrial principles and has no politics in it. Secretary Tracy has placed in Captain Folger's hands the entire management, without interference from any source. Although the Captain comes from New England and Ohio Whig and Republican ancestry and is of the same way of thinking, if he thinks of polltics at all, he has adopted the rule of making merit the test of employment or retention, and therefore has both parties represented, one rivaling the other in application to work, and thus securing the maximum results. It is the determination of Captain Folger to demonstrate to the country that a Government establishment can be run not only in competition with private establishments, but even with greater economy. In accordance with his plan no time is lost and the men and machinery go about their work with the precision and discipline of gunners on the deck of a ship. At five minutes before the hour of starting work the engines are put in motion and every mechanic or artisan is at his post. At the moment of starting every machine is required to begin its work. No one visiting the works by permission is allowed to converse with the workmen under penalty of ejectment by the yard force or a squad of marines if necessary. The loafing, as in other yards, by ward rounders or politicians does not exist, and as a consequence everything moves like clock-work. Secretary Tracy fully sustains his efficicnt Inspector of Ordnance and Superintendent of the Gun Foundry and takes the greatest pride in this establishment.

The plant as it now stands has been practically built by Captain Folger. Certain machine tools, domestic and foreign, when up to his standard of perfection for the work he has recommended for purchase, but the largest appliances he has constructed from plans of his own and by his own men. There are new machines to be added to the plant, but all calibers from 4 to 12 inch guns are now being turned out as rapidly as possible. The original lathes being inadequate to the increased size of the guns, Captain Folger is now extending several to 75 feet for 12 inch and 80 feet for 16-inch guns. Also cranes capable of handling these immense masses weighing 110 tons are being erected. The shops have direct connection with the Pennsylvania Railroad system, so that forgings of the largest size can be brought from the works at Bethlehem or Midvale and delivered under the cranes ready to begin their journey toward completion into a perfect gun weighing as high as 110 tons with the facility of handling a gun-barrel. The gun foundry is now turning out guns faster than the Bethlehem and Midvale works can deliver the forgings, and will be ready to deliver the armaments of ships as rapidly as they can be built.

The finest machine tools have been furnished by Bement, Miles & Co. and William Sellers & Co., of Philadelphia, and the Armington & Sims Machine Company, of Providence. The 40 and 110 ton cranes, immense machines, were built by the Morgan Engine Company, of Alliance, Ohio. A foreign-built band-saw for cutting shields made of 2-inch thick steel is a wonder of construction. It is from the works of Greenwood & Batley, of Leeds, England, and cost $16,000. It will be ready for use in a few weeks.

The National Gun Foundry for Naval Ordnance, when the present machinery is in position, will be the most complete in the world, not excepting the extensive works of the French Government, near Paris.

Citizens of Schoharie County, in this State, are exerting themselves to secure the removal of the State prison from Sing Sing to the quarries in that region, alleging that their labor might be applied with great advantage to the State Treasury in the excavation of rock for cement, which is said to be of an excellent quality. The State was taxed nearly $400,000 for idle prisoners last year, which is 4 per cent. on $10,000,000. The amount of cement shipped from Rondout last year was 2,000,000 barrels. At $1 per barrel one-fifth of that would pay the entire deficiency of last year and make the prisons of the State self-supporting.

The tunnel under the lake at Cleveland for the water-works has been pushed forward through the quicksand under air-pressure, and the treacherous vein is supposed to have been passed.

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CURRENT HARDWARE PRICES.

OCTOBER 9, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

Ammunition.—

Caps, Percussion, ℔ 1000—

Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's....34@35¢
E. B. Trimmed Edge, 1-10's....40@48¢
E. B. Grnd. Edge, Cent. Fire, 1-10's....46@47¢
Musket Waterproof, 1-10's....50¢
G. D....28¢
S. B. Genuine Imported....45¢
Eley's E. B....54¢ @ 55¢
Eley's D Waterproof, Central Fire...$1.60

Cartridges.

Rim Fire Cartridges....50&5&2 %
Rim Fire Military....15&2 %
Cent. Fire, Pistol and Rifle....25&5&2 %
Cent. Fire, Military and Sporting 15&5&2 %
Blank Cartridges, except 22 and 32 cal., additional 10 % on above discounts.
Blank Cartridges, 22 cal., $1.75....2 %
Blank Cartridges, 32 cal., $3.50....2 %
Primed Shells and Bullets....15&5&2 %
B. B. Caps, Round Ball, $1.75....2 %
B. B. Caps, Con. Ball, Swgd., $2.00....2%

Primers—

Berdan Primers, $1.00....2%
B. L. Caps (for Sturtevant Shells) $1.00, 2%
All other Primers, $1.20....2%

Shells—

First quality, 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list)....30&10&2%
Star, Club, Rival and Climax brands, 20&10&2%
Selbold's Comb. Shot Shells....15&2%
Brass Shot Shells, 1st quality....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%
I X L, 10 and 12 guage....40&5&2%
"Special," 16 gauge....30&10&5&2%
"Special," 10 and 12 gauge....40&10&2%
Fowler's Pat....$3.25

Shells Loaded—

Standard. List....40&10@40&10&10%

Wads—

U. M. C. & W. R. A.—B. E., 11 up..$2.00
U. M. C. & W. R. A.—B. E., 9&10.. 2.30
U. M. C. & W. R. A.—B. E., 7&8... 2.60
U. M. C. & W. R. A.—P. E., 11 up.. 3.10
U. M. C. & W. R. A.—P. E., 9&10.. 4.00
U. M. C. & W. R. A.—P. E., 7&8... 4.90
Eley's B. E., 11 up....$1.75
Eley's P. E., 11@20....2.80

Anvils.—

Eagle Anvils, ℔ ℔ 10¢....20@20&5%
Peter Wright's....10¢
Armitage's Mouse Hole....8¾¢
Armitage's Mouse Hole, Extra....11½@11½¢
Trenton....9½@9½¢
Wilkinson's....9½@10¢
J. & Riley Carr, Pat. Solid....11@11½¢
Moore & Barnes Mfg. Co....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00....20%
Cheney Anvil and Vise....25%
Allen Anvil and Vise, $3.00....40&10%

Apple Parers—

Advance....℔ doz $4.75
Antrim Combination....℔ doz 5.50
Baldwin....℔ doz 5.25
Champion....℔ doz 7.25
Daisy....℔ doz 4.00
Eureka, 1888....each 17.00
Family Bay State....℔ doz 12.00
Favorite....℔ doz 5.00
Gem....℔ doz 5.25
Gold Medal....℔ doz 4.00
Ideal....℔ doz 4.00
Improved Bay State....℔ doz 30.00
Little Star....℔ doz 4.50
Monarch....℔ doz 13.50
New Lightning....℔ doz 5.50
Oriole....℔ doz 4.00
Penn....℔ doz 4.00
Perfection....℔ doz 4.00
Pomona....℔ doz 4.00
Rocking Table....℔ doz 6 00
Turntable....℔ doz 4.50
Victor....℔ doz 13.50
Waverly....℔ doz 4.00
White Mountain....℔ doz 4.50
72....℔ doz 4.25
76....℔ doz 5.75
78....℔ doz. 6.50

Augers and Bits—

Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co. 70%
French, Swift & Co. (F. H. Beecher, Rockford Bit Company.
Cook's, Douglass Mfg. Co....55 %
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip....60%
Patent Solid Head....30%
C. E. Jenning & Co., No. 10, extension lip....40%
C. E. Jennings & Co., No. 30....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50..20%
Lewis' Patent Single Twist....45%
Russell Jennings' Augers and Bits....25%
Imitation Jennings' Bits....60&60&5%
Pugh's Black....20%
Rockford, Jenning's Pattern....60%
Car Bits....50&10@60%
L Hommodieu Car Bits....15&10%
Worstner Pat. Auge Bits....10%
Cincinnati Bell-Hangers' Bits....3 %

Hollow Augers—

Ives'
French, Swift & Co. } 33⅓@ 33⅓&10%
Douglass'
Bonney's Adjustable, ℔ doz $48....40&10%
Stearns'....20&10%
Ives' Expansive, each $4.50....50&5%
Universal Expansive, each $4.50....20%
Wood's....25@25&10%
Cincinnati Adjustable....30@30&5%
Cincinnati Standard....25&10%

Expansive Bits—

Clarks' small, $18; large, $26...35@35&5%
Ives' No. 4, ℔ doz $60....40%
Swan's....40%
Steer's, No. 1, $26; No. 2, $22....35%
Stearns' No. 2, $48....20%

Gimlet Bits—

Common....℔ gross $2.75@$3.25
Diamond....℔ doz $1.10....25&10%
Bee....25@25&5%
Double Cut, Shepardson's....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ℔ gro....$5.25
Double Cut, Douglass'....40&10%
Double Cut, Ives'....60@60&10%

Bit Stock Drills—

Morse Twist Drills....50&10&5%
Standard....50&10&5%
Cleveland....50&10&5%
Syracuse, for metal....50&10%
Syracuse, for wood (wood list)..30@30&5%
Williams' or Holt's, for metal..50&10&10%
Williams' or Holt's, for wood....40&10%
Cincinnati, for wood....30&5%
Cincinnati, for metal....40&10%

Ship Augers and Bits—

L'Hommedieu's....15&10@15&10&5%
Watrous'....15&10@15&10&10%
Snell's....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—

Sewing, Brass Fer. ℔ gr, $3.50....45&10%
Pat. Sewing, Short..$1.00 ℔ doz....40&10%
Pat. Sewing, Long....℔ doz $1.20
Pat. Peg, Plain Top. ℔ gr $10.00...45&10%
Pat. Peg, Leather Top. ℔ gr $12.00..45&10%

Awls, Brad Sets, &c—

Awls, Sewing, Common ℔ gr $1.70, 35%
Awls, Should. Peg. ℔ gr $2.45, 40@40&10%
Awls, Pat. Peg, ℔ gr 63¢....40@40&10%
Awls, Shouldered Brad..2.70 ℔ gr....35%
Awls, Handled Brad...$7.50 ℔ gr....45%
Awls, Handled Scratch ℔ gr, $7.50..35&10%
Awls, Socket Scratch. ℔ doz, $1.50..25@30%

Awl and Tool Sets—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz $10.00....55&10%
Bray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12. 2, $18....25%
Henry's Combination Haft...℔ doz $6.50
Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50....30&10%

Axes—

Makers' and Special Brands—

First quality....℔ doz $6.00@$6.50
Others....℔ doz $5.50@$5.75

Axle Grease—

Fraser's....Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes....℔ gr $9.50
Dixon's Everlasting, in bxs...℔ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00

Axles—

No. 1....4¢@4½¢, No. 2 5½¢@5½¢
Nos. 7 to 14....55&5%
Nos. 15 to 18....47½%
Nos. 19 to 22....70%
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):
Less than 10 sets....33⅓%
Over 10 sets....33⅓&5%

Bag Holders.—

Sprengie's Pat....℔ doz $18....60%

Balances—

Spring Balances....50%
Common 24-℔....℔ doz $1.50....50%
Chatillon's Spring Balances....50%
Chatillon's Circular Spring Balances..60%

Bells—

Hand—

Light Brass....70&10 @ 75%
Extra Heavy....60&10%
White Metal....60&10&10%
Silver Chime....33⅓&10%
Globe (Cone's Patent)....25&10@35%

Door—

Gong, Abbe's....33⅓&10%
Gong, Yankee....45&10%
Gong, Barton's....40&10@50%
Crank, Taylor's....25&10%
Crank Brooks'....50&10&2%
Crank, Cone's....10%
Crank, Connel's....20&10%
Lever, Sargent's....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned....25&10%
Lever, R. E. M. Co.'s....50&10&2%
Pull, Brook's....50&10&2%
Pull, Western....25&10%

Cow—

Common Wrought....60&10%
Western....20&10%
Western, Sargent's list....70&10%
Kentucky, "Star"....20&10%
Kentucky, Sargent's list....70&10%
Dodge, Genuine Kentucky....70&70&10%
Texas Star....50&10@50&10&5%
Call....40@40&5%
Farm Bells....℔ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'....60@60&5%
Molders'....40@40&10%
Hand Bellows....40&10@50%

Belting, Rubber—

Common Standard....70&10%
Standard....70&70&5%
Extra....60&5@60&10%
N. Y. B. & P. Co., Carbon....60&10&5%
N. Y. B. & P. Co., Diamond....50&10%

Bench Stops—

Morrill's....℔ doz $9, 50%
Hotchkiss's....℔ doz $5, 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's....℔ doz $3....10%
Cincinnati....25&10%

Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—

Extension,
Barber's, ℔ doz $15.00....40@40&10%
Ives, ℔ doz $20.00....60&5@60&10%
Diagonal....℔ doz $24.00, 40%
Angular....℔ doz $24.00, 40&5%

Blind Adjusters—

Domestic....℔ doz $3.00, 33⅓%
Excelsior....℔ doz $10.00....50&10&2%
Washburn's Self-Locking....20&20&10%

Blind Fasteners—

Mackrell's, ℔ doz $1.00....20@20&10%
Van Sand's Screw Pat., $15 ℔ gr..60@10%
Van Sand's Old Pat., $15.00 ℔ gr..55&10%
Washburn's Old Pattern, ℔ gr....$9.00
Merriman's....new list
Austin & Eddy No. 2008, ℔ gr....$9.00
Security Gravity, ℔ gr....$9.00

Blind Staples—

Barbed, ½ in. and larger....℔ ℔ 7½@8¢
Barbed, ⅜ in....℔ ℔ 8½@9¢

Blocks—

Ordinary Tackle, list May 20, 1889...50%
Cleveland Block Co., Mal. Iron....50%
Moore's Novelty, Mal. Iron....50%

Bolts—

Door and Shutter—

Cast Iron Barrel, Square, &c..70&70&10%
Cast Iron Shutter Bolts....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts....60%
Wrought Barrel....70@70&10%
Wrought Square....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list...50&10%
Wr't B.K.Flush, Com'n " ...55&10%

Carriage, Machine, &c.—

Com. list June 10, '84....75&7½&2%
Genuine Eagle, list Oct., '84...75&10&80%
Phila. pattern, list Oct. 7, '84..80@80&10%
R.B.&W., old list....70%
Machine, according to size....75&10&80%
Bolt Ends, according to size..75&10&80%

Tire—

Common, list Feb. 28, '83....70%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83....70%
Phila., list Oct. '84....82½%
Keystone, Philadel., list Oct. '84...80%
Norway, Phila., list Oct. '84...75&10%
American Screw Company:
Norway, Phil., list Oct. 16, '84....75&10%
Eagle, Phil., list Oct. 16, '84....80%
Philadel., list Oct. 16, '84....82½%
Bay State, list Feb. 28, '83....70%
R.B.&W., Philadel., list Oct. 16, '84...82½%

Stove and Plow—

Stove....65%
Plow....60&5%
R. B. & W., Plow....55%

Borax....℔ ℔ 9½@10½¢

Boring Machines—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	...40&10&10	
Jennings	5.50	6.75	...45@45&10	
Other Machines	2.35	2.75		net
Phillips' Patent with Augers	00	7.50		

Bow Pins—

Humason, Beckley & Co.'s....60&10%
Sargent & Co's....$17 and $18....60&10%
Peck, Stow & W. Co. 50&10@50&10&5%

Braces.—

Barber's,
Nos. 8, 10 and 12....75&10@80%
Plated, Nos. 8, 10 and 12....65&10@70%
Osgood's Ratchet....40&10@50%
Spofford's....50&5@50&10%
Ives' New Haven Novelty....70@70&5%
New Haven Ratchet....60&5@60&10%
Barber Ratchet....60&5@60&10%
Barbers....60&5%
Spofford....60&5@60&10%
Common Ball, American....$1.00@$1.10
Bartholomew's,
Nos. 25, 27 and 30....50&10@60&5%
Nos. 117, 118, 119....70@70&5%
Amidon's
Barker's Imp'd Plain....75&10@80%
Barker's Imp. Nickeled....65&10@70%
Ratchet....75&10@80%
Eclipse Rachet....60%
Globe Jawed....40@40&10%
Corner Brace....40@40&10%
Universal, 8 in., $2.10 10 in....$2.25
Buffalo Ball....$1.10@$1.15
P. S. & W....50&10%

Brackets—

Shelf plain, Sargent's list, 55&10@55& 10&10%
Shelf, fancy, Sargent's list, 60&10@60 &10&10%
Reading, plain....50&10@60&10&5%
Reading, Rosette....60&10@60&10&10%

Bright Wire Goods....87½

Broilers—

Henis' Self- } Inch.... 9 10 9x11
Basting. } Per doz...$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Bull Rings—

Union Co. Nut....55%
Sargent's....66⅔&10@70&5%
Hotchkiss' low list....30%
Humason, Beckley & Co.'s....70%
Peck, Stow & W. Co's..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Butcher's Cleavers—

Bradley's....25@30%
L. & I. J. White....20&5%
Beatty's....40@40&5%
New Haven Edge Tool Co.'s....40%
P. S. & W....33⅓&5@33⅓&10%
Foster Bros....30%
Schulte, Lohoff & Co....40@40&5%

Butts—

Brass—

Wrought Brass....75@75&10%
Cast Brass, Tiebout's'....33⅓%
Cast Brass, Corbin's, Fast....33⅓&10%
Cast Brass, Loose Joint....33⅓&10%

Cast Iron—

Fast Joint, Narrow....50&10&5@60&5%
Fast Joint, Broad....55&10&5@60&10%
Loose Joint.
Loose Joint, Japanned.
Loose Joint, Jap. with Acorns..
Parliament Butts. ..70&10 @75%
Mayer's Hinges.
Loose Pin, Acorns.
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips....

Wrought Steel—

Fast Joint, Narrow.
Fast Joint, Lt. Narrow.
Fast Joint, Broad.
Loose Joint, Broad. .70&10 @75%
Table Butts, Back Flaps, &c....
Inside Blind, Regular.
Inside Blind, Light.
Loose Pin.
Bronzed Wrought Butts....50%

Calipers—

See Compasses.

Calks, Toe—

Gautier....℔ ℔ 5½@6¢
Dewicks (Burke)....℔ ℔ 5½@6¢

Can Openers—

Messenger's Comet....℔ doz $3.00, 25%
American....℔ gross $3.00
Duplex....doz 25¢, 15@20%
Lyman's....℔ doz $3.75, 20%
No. 4 French....℔ doz $2.25, 55@60%
No. 5, Iron Handle....℔ gr $6.00, 45@50%
Eureka....℔ doz $2.50, 10%
Sardine Scissors....℔ doz $2.75@3.00
Star....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50 50&10&10%
World's Best, ℔ gross, No. 1, $12.00 No. 2, $24.00; No. 3, $36.00....50&10%
Universal, ℔ doz $3.00....30&5%
Domestic, ℔ doz $2.50....45%
Champion ℔ doz $2.00....50

Cards—
Horse & Curry.....10&10@10&10&10%
Cotton.....10@10&10%
Wool.....10@10&10%

Carpet Stretchers—
Cast Steel, Polished.....₱ doz $2.25
Cast Iron, Steel Points.....₱ doz 80¢
Socket.....₱ doz $1.75
Bullard's.....25@25&10%

Carpet Sweepers—
Bissell No. 5.....₱ doz $17.00
Bissell No. 7 New Drop Pan.....₱ doz $19.00
Bissell, Grand.....₱ doz $36.00
Grand Rapids.....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₱ doz $15.00
Jewel.....₱ doz $17.00
Improved Parlor Queen,
Nickeled.....₱ doz $27.00
Japanned.....₱ doz $24.00
Excelsior.....₱ doz $22.00
Garland.....₱ doz $18.00
arlor Queen.....₱ doz $24.00
Housewife's Delight.....₱ doz $15.00
Queen.....₱ doz $16.00
Queen, with band.....₱ doz $18.00
King.....₱ doz $30.00
Weed, Improved.....₱ doz $18.00
Hub.....₱ doz $16.00
Cog-Wheel.....₱ doz $16.00
Conqueror.....₱ doz $22.00
Easy.....₱ doz $22.00
Monarch.....₱ doz $22.00
Goshen.....₱ doz $21.00
Advance.....₱ doz $18.00
Ladies' Friend, No. 1, ₱ doz, $15.00; No. 2.....₱ doz $16.00
American.....₱ doz $15.00
Grand Republic.....₱ doz $35.00

Cartridges—
See Ammunition.

Casters—
Bed.....} Brass....55@55&10%
Plate.....} Others...60@60&10%
Shallow Socket.....40&10%
Deep Socket.....40&10%
Yale,Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Payson's Anti-friction.....60@60&10%
Giant Truck Casters.....30¢
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—
Humason, Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....50&10%

Chain—
Trace, 6½-10-2, exact, ₱ pair, $1.03.....50&10@50&10&5%
Trace, 6½-10-3, exact, ₱ pair 92¢.....50&10@50&10&5%
Trace, 7-10-2, exact, ₱ pair $1.11.....50&10@50&10&5%
NOTE.—Traces, "Regular" sizes, 3¢ net ₱ pair less than exact.
Log, Fifth, Stretcher, and other fancy Chains, List Nov. 1, 1884 50&10@50&10&5%
American Coil, in cask lots,
3-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ ¾
$8.25 5.75 5.00 4.00 3.70 3.60 3.50 3.40
Less than cask lots, add ¼@½¢ ₱ ℔.
German Coil, list of June 20, 1887 50&10&5@60%
German Halter Chain, list of June 20, 1887.....50&10&5@60%
Covert Halter.....60&2%
Covert Traces.....35@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₱ ℔5½@5½¢ ₱ ℔
Jack Chain, Iron.....75@75&5%
Jack Chain, Brass.....70@70&5%

Chalk—
White.....₱ gr 50¢
Red.....₱ gr 70¢
Blue.....₱ gr 85¢
See also Crayons.

Chalk Lines—
See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....} 75&10 @ 75&10&5%
New Haven.....}
Witherby.....}
Mix.....}
Ohio Tool Co.....}
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60@10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to £
Buck Bros.....30%
Cold Chisels, ₱ ℔.....16@19¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable,each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Balz Pat.....25%
Skinner's Pat. Drill Chucks.....30%
Skinner's Independent Lathe Chucks.40%
Skinner's Pat. Comb. Chuck.....40%

Clamps—
R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Gray's.....20%
Adjustable, Lambert's.....20%
Adjustable, Snow's.....40&5%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....20&10%
Stearn's Adjustable Cabinet and Corner.....20&10%
Cabinet, Sargent's.....66⅔&10%
Carriage Makers', Sargent's.....70&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises.
Carpenters', Cincinnati.....1.5%

Clips—
Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16 65&5%
Superior Axle Clips.....66⅔&5&70%
Norway Spring Bar Clips, 5-16...60&5&5%
Wrought-Iron Felloe Clips.....₱ ℔, 5½¢
Steel Felloe Clips.....₱ ℔, 5¢
Baker Axle Clips.....25%

Cockeyes.....50%

Cocks, Brass.
Hardware list.....50&2%

Coffee Mills—
Box and Side, List Jan. 1, 1888.....60&2%
American, Enterprise Mfg Co.20&10@30%
The Swift, Lane Bros.....20@10%

Compasses Dividers, &c—
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers 25&10&10%
Lock Calipers and Dividers.....25&10%
Combination Dividers.....25&10%

Coopers' Tools—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Corkscrews—
Humason & Beckley Mfg. Co..40@40&10%
Clough's Pat.....33⅓@33⅓&5%
Howe Bros & Hulbert.....35%

Corn Knives and Cutters—
Bradley's.....10%
Wadsworth's.....25%

Cradles—
Grain.....50&5&2 @ 50&10&2%

Crayons.
White Crayons, ₱ gr 12¢@12½¢.....10%
D. M. Stewart Mfg. Co., Metal Workers, ₱ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₱ gr, $2.50.....25%
See also Chalk.

Crow Bars—
Cast Steel.....₱ ℔ 4¢
Iron, Steel Points.....₱ ℔ 3½¢

Curry Combs—
Fitch's.....50&10@50&10&10%
Rubber per doz $10.00.....20%
Perfect.....50%

Curtain Pins—
Silvered Glass.....net
White Enamel.....net

Cutlery—
Beaver Falls & Booth's.....33⅓
Wostenholme.....$7.75 to £

Dampers, &c—
Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Dividers—
See Compasses.

Dog Collars—
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%

Door Springs—
Torrey's Rod, regular size....₱ doz $1.30
Gray's, ₱ gr., $20.00.....20%
Bee Rod ₱ gr., $20.00.....20%
Warner's No. 1, ₱ doz, $2.50; No. 2, $3.30.....40&10&50%
Gem (Coil), list April 19, 1886.....10%
Star (Coil), list April 19, 1886.....20%
Victor (Coil).....60@60&10%
Champion (Coil).....60@10@60&10&10%
Philadelphia, 5 in., $5.00; 8 in., $7.75.....%
Cowell's....No. 1, ₱ doz, $18.00; No. 2, $15.00.....50%
Rubber, complete, ₱ doz, $4.50...55&10%
Hercules.....50%
Shaw Door Check and Spring.25@30@35%

Drawing Knives—
Witherby.....} 75&10 @ 75&10 &5%
P. S. & W.....}
Mix.....}
New Haven.....}
Merrill.....60@10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bailey's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Drills and Drill Stocks—
Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5%
Ratchet, Whitney's.....20&10%
Ratchet, Weston's.....20@25%
Ratchet, Moore's Triple Action...25@30%
Ratchet, Curtis & Curtis.....30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools...$1.75@$1.85

Twist Drills—
Morse.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%
Cleveland.....50&10&5%
Williams.....50&10&10%
New Process.....50&10&5%

Drill Bits.—See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—
Smallsizes,.....₱ ℔ 6¾¢
Large sizes.....₱ ℔ 6¼¢

Egg Beaters.
Dover.....₱ doz $1.50
National, ₱ doz $4.50.....35⅓%
Family (T. & S. Mfg. Co.), ₱ gro $17.00@$18.00
Duplex (Standard Co.).....₱ gro $15.00
Rival (Standard Co.).....₱ gro $12.00
Large Duplex (Standard Co.), ₱ doz $4.50
Triumph (T. & S. Mfg. Co.), ₱ gro $10.50@$11.50
Advance, No. 1.....₱ gro $10.50
Advance, No. 2.....₱ gro $10.00
Bryant's.....₱ gro $14.00
Ayres' Spiral.....₱ gro $5.00
Double (H. & R. Mfg. Co).....₱ gro $16.20
Easy (H. & R. Mfg. Co.).....₱ gro $14.00
Triple (H. & R. Mfg. Co.).....₱ gro $16.20
Spiral (H. & R. Mfg. Co.).....₱ gro $4.50
Paine, Diehl & Co.'s.....₱ gro $24.00

Egg Poachers—
Buffalo Steam Egg Poachers, ₱ doz, No. 1, $6.00; No. 2, $9.00.....25%

Electric Bell Sets.—
Wollensak's.....20%
Bigelow & Dowse.....20%

Emery— No. 4 to 46 gr. | No. 54 to 150 gr. | Flour, CF FF.
Kegs, ₱ ℔.....4½¢ | 5 ¢ | 2¾¢
½ kegs, ₱ ℔...4¾¢ | 5½¢ | 2¾¢
¼ kegs, ₱ ℔...5 ¢ | 5½¢ | 3 ¢
10-℔ cans, 10 in case.....6 ¢ | 6½¢ | 5 ¢
10-℔ cans, less than 10.....10 ¢ | 10 ¢ | 7½¢

Enameled and Tinned Ware—
See Hollow-Ware.

Escutcheon Pins—
Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Escutcheons.
Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Faucets.—
Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots.....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....50%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₱ doz $50.00.....20&10%
Lane's, ₱ doz $36.00.....25&10%
Victor, ₱ doz $36.00.....25&10%

Felloe Plates.....₱ ℔ 6@6¼¢

Fifth Wheels.—
Derby and Cincinnati.....50&5%
Brewster.....55&5%

Files—
Domestic—
Nicholson Files, Rasps, &c.....60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
Other makers, best brands 60&10@60&10&10%
Fair brands.....60&10&10@70%
Second quality.....70&10@75&10%
Nicholson's Horse Rasps....60&10@60&10&5%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Imported—
J. & Riley Carr.....List, April 1, 1883, 15%
J. & Riley Carr Horse Rasps.....10%
Moss & Gamble....List, April 1, 1883, 15%
Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%
Turton's.....Turton's list, 20@25%
Greaves' Horse Rasps..American list, 60%

Fluting Machines—
Knox, 4½-inch Rolls....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz $15.30.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter, ₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo.....₱ doz $10.00.....10%

Fluting Scissors—.....45%

Fodder Squeezers—
Blair's.....₱ doz $2.00
Blair's "Climax".....₱ doz $1.25

Forks—
Hay, Manure, &c., Asso. List.....70%
Hay, Manure, &c., Phila. List 60@60&5%
Plated, see Spoons.

Freezers, Ice Cream—
Buffalo Champion.....65&65&5%
Shepard's Lightning.....65 @ 65&5%
White Mountain.....50&20&5%
New Arctic.....50&40&5%
American.....60%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless and Giant.....60&10
Zero and Pet.....65&10
Boss.....65&10&10
Keystone, each, $1.50.....25%

Fruit and Jelly Presses—
Enterprise Mfg. Co.....20&10@30%
Henis.....₱ doz $2.50
Shepard's Queen City.....40%

Fry Pans—
High List.....75&10@75&10 &5%
No..... 0 1 2 3 4
₱ doz..$3.75 $4.70 $5.30 $5.95 $6.55
No..... 5 6 7 8
₱ doz.....$7.50 $8.75 $10.00 $11.25
Low List.....70 @ 70&10%
No..... 0 1 2 3 4
₱ doz..$3.00 $3.75 $4.25 $4.75 $5.25
No..... 5 6 7 8
₱ doz.....$6.00 $7.00 $8.00 $9.00

Fuse— ₱ 1000 ft
Common Hemp Fuse,for dry ground.$2.70
Common Cotton Fuse,for dry ground 2.85
Single Taped Fuse, for wet ground.. 4.25
Double Taped Fuse, for very wet gr. 5.40
Triple Taped Fuse, for very wet gr. 6.50
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gauges—
Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch, 25&10%
Wire, low list.....10&10%
Wire, Wheeler, Madden & Co.....10%
Wire, Morse's.....50@50&5%
Wire, Brown & Sharpe's.....10@20%

Gimlets—
Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₱ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₱ gr $12.....25@25&5%

Glue—
Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Le Page & Co.'s Improved Process 25@25&5%

Glue Pots—
Tinned.....40%
Enameled.....40&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Grindstones—
Small, at factory....₱ ton $7.50@9.00

Grindstone Fixtures—
Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%

Hack Saws.—
See Saws.

Halters—
Covert's, Rope, ½-in. Jute.....50&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&2%
Covert's Jute Horse and Cattle Ties, 60&10&2%

Hammers—
Handled Hammers—
Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....} List Jan. 15, '87
Humason & Beckley.....} 50@50&10%
Atha Tool Co.....}
Fayette R. Plumb.....40&10@50%
C. Hammond & Son.....40&10@50%
Verree.....5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@25
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%
Heavy Hammers and Sledges—
3 ℔ and under.....₱ ℔ 40¢ } 70@70&10%
3 to 5 ℔.....₱ ℔ 36¢ }
Over 5 ℔.....₱ ℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢ ₱ ℔

Handcuffs and Leg Irons—
R. I. Tool Co., Handcuffs, $15.00 ₱ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ doz 10%
Tower's.....25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₱ doz $48.00; Nickeled, $57.00; 3 Hands, Polished, ₱ doz $72.00; Nickeled, $84.00.....25%

Handles—
Iron, Wrought or Cast—
Door or Thumb.
Nos..... 0 1 2 3 4
Per doz....$0.90 1.00 1.18 1.35 1.50
60&10&10%
Roggin's Latches.....₱ doz 30@35¢
Bronze Iron Drop Latches..₱ doz 70¢ net
Jay'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.85.....net
Barn Door, ₱ doz $1.40.....10&10%
Chest and Lifting.....70%
Handles, Wood—
Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, Sledge, &c...40%
Brad Awl.....₱ gr $2.00
Hickory Firmer Chisel, ass'd. ₱ gr 4.50
Hickory Firmer Chisel, large. ₱ gr 5.00
Apple Firmer Chisel, ass'd...₱ gr 5.00
Apple Firmer Chisel, large...₱ gr 6.00
Socket Firmer Chisel, ass'd..₱ gr 3.00
Socket Framing Chisel, ass'd.₱ gr 5.00
J. S. Smith & Co.'s Pat File.....50%
File, assorted.....₱ gr 2.75 } 40@
Auger, assorted.....₱ gr 5.00 } 40&10%
Auger, large.....₱ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass'.....₱ set $1.25
Pat. Auger, Swan's.....₱ set $1.00
Post Hole, Shovel, &c.....50@10%

Cross-Cut Saw Handles—
Atkins' No. 1 Loop, ₱ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Boynton's Loop Saw Handles, 50¢... 60%
Champion.....15¢

Hangers—
Barn Door, old patterns...60&10&10&70%
Barn Door, New England...60&10&10&70%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....60%
Climax Anti-Friction for Wood Track.55%
Zenith for Wood Track..... 55%
ed's Steel Arm..... 50%
allenge, Barn Door..... 50%
Sterling's Imp'ved (Anti-Friction).65&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00..... 50&25%
Cheritree.....50&10%
Kidder's.....50&10&60%
The Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in, $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Pat., No. 4, $12.00; No. 5, $14.40; No. 6, $18.00.....50&15&60%
Wood Track Iron Clad, ₱ ft. 10¢.....50 &15&60%
Carrier Steel Anti-Friction.....50&50&5%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30&30&10%
Lane's Steel Anti-Friction.....50%
Ball Bearing Door Hanger..20&10&25&10%
Warner's Pat.....20&20&10%
Stearns' Anti-Friction.....20&20&10%
Stearns' Challenge.....25&10&25&10&10%
Faultless.....40&40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5½, 7 and 8.....20&10%
Crescent.....60&60&10%
Nickel, Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap..33⅓%
Scranton Anti-Friction Double Strap..40%
Universal Anti-Friction.....40%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10&40&10&5%
May.....50&5&50&10%
Barry, $6.00.....40&10%

Harness Snaps—
See Snaps.

Hatchets—
List Jan. 1, 1886.
Isaiah Blood.....35&40%
Hunt's Shingling, Lath and Claw..40&5%
Hunt's Broad.....40%
Buffalo Hammer Co.....40&10&50%
Hurd's.....40&10&50%
Fayette R. Plumb.....40&10&50%
Wm. Mann, Jr., & Co.....50&50&5%
Underhill Edge Tool Co.....40&5&40&10%
Underhill's, Haines and Bright.....33⅓%
C. Hammond & Son.....40&10&50%
Simmons'.....40&10&50%
Peck's.....40&10&40&10&5%
Kelly's.....50&50&5%
Sargent & Co.....50%
Ten Eyck Edge Tool Co.40&10&40&10&5%
Collins.....10%
Schulte, Lohoff & Co.....50&50&5%

Hay and Straw Knives—
Lightning Mfrs'. price ₱ doz $18.00, 25% But jobbers cut this price freely.
Gem.....₱ doz $10
Wadsworth's.....40&7½&40&10%
Carter's Needle.....₱ doz $11.50&$12.00
Heath's.....₱ doz $13.50&14.00
Auburn Hay, Com. and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz $10.00

Hinges—
Wrought Iron Hinges
Strap and T.....75&5&75&10%
Screw Hook and Strap: 6 to 12 in., ₱ lb. .4 ¢; 14 to 20 in., ₱ lb.. 3½¢; 22 to 36 in., ₱ lb....3 ¢
Heavy Welded Hook: 6 to 12 in., ₱ lb.....4 ¢; 14 to 20 in., ₱ lb.. 3½¢; 22 to 36 in., ₱ lb...3 ¢
Screw Hook and Eye: ⅛ in., ₱ doz $1.50; ⅙ in., ₱ doz $2.45; ¾ in., ₱ doz $3.80 } 10%
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges (8, 10 & 12 in., ₱ lb.....5¢ "Providence" over 12 in., ₱ lb. ..4¢
Spring Hinges—
Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Barker's Double Acting.....20&10%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15&20%
Chicago.....30%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Gate Hinges—
Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
N. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&25%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Common Sense.....₱ doz pair $4.50, 50%
Seymour's.....45&10%
Shepard's.....60&10&5%
Reed's Latch and Hinges. ₱ doz $12.00, 50%
Blind Hinges—
Parker.....75&2%
Palmer.....50&5&10%
Seymour.....70&2%
Nicholson.....45&10%
Cutter.....50%
Clark's, Nos. 1, 3, 5, 40 and 50 75&10&5&80%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 13 75&10&55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10&75&10&5%
Shepard's Noiseless.....75&10&5% Niagara.....80&2½% Buffalo.....80&5% Clark's Genuine Pat.....80&5% O. S., Lull & Porter.....75&10&80% Acme, Lull & Porter.....75&5% Queen City Reversible.....75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $10.50; No. 3, for Brick, $13.50.....25&2%

Hoes—
Handled—
Garden, Mortar, &c.....70%
Planter's, Cotton, &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00
Eye—
D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat..60&5&60&10%
Hubbard & Co., S. & O. Pat.60&5&60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5&60&10%
Grub.....60&60&10%

Hog Rings and Ringers—
Hill's Improved Ringers. . .₱ doz $4.25
Hill's Old Style Ringers.....₱ doz $2.75
Hill's Tongs.....₱ doz $4.50
Hill's Rings.....₱ doz bxs $2.15@2.25
Perfect Rings.....₱ doz bxs $1.60@1.70
Perfect Ringers.....₱ doz $2.15@2.25
Blair's Hog Ringers.....₱ doz $2.25@2.50
Blair's Hog Rings.....₱ doz 90¢@$1.00
Champion Ringers.....₱ doz $2.00
Champion Rings, Double.....₱ doz $2.25
Brown's Ringers.....₱ doz $2.00
Brown's Rings.....₱ doz $1.25@1.30

Hoisting Apparatus—
Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's.....25%

Holders, File and Tool—
Balz Pat.....₱ doz $4.00; 25%
Nicholson File Holders..... 20%

Hollow-Ware—
Iron—
Stove Hollow-Ware—
Ground.....60@60&5%
Unground.....60&10@60&10&10%
Boilers and Saucepans.....40&5%
Tinned Boilers and Saucepans.....40%
Gray Enameled-Ware—
Stove.....45&50%
Maslin Kettles.....60&10&60&10&10%
Boilers and Saucepans.....40&5%
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Rustless Hollow-Ware.....50@50&5%
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Silver Plated
4 mo. or 5 % cash in 30 days.
Reed & Barton..... } 40&5%
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
Hartford Silver Plate Co..... } 40&5&5%
William Rogers Mfg. Co.....

Hooks—
Cast Iron—
Bird Cage, Sargent's list.....
Bird Cage, Reading..... } 60&10&10%
Clothes Line, Sargent's list..
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%
Wrought Iron—
Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.
Wire—
Wire Coat and Hat, Gem, list April, 1886.....50%
Wire Coat and Hat, Miles', list April, 1886.....50%
Indestructible Coat and Hat.....45%
Wire Coat and Hat, Standard.....45%
Belt.....80&80&10%
Miscellaneous.
Grass. No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55&60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70&70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American..... 50%
Bench Hooks.....See Bench Stops.

Horse Nails—

Nos.	6	7	8	9	10
Ausable.....	28¢	26¢	25¢	24¢	23¢.

25&10@25&10&10%
Clinton, Fin.....10½ @ 11¢, net
Essex .....28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Lyra.....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Snowden .....25¢ 23¢ 22¢ 21¢ 20¢. 40&10&5@50%
Putnam.....23¢21¢ 20¢ 19¢ 18¢. 1000 ℔ in year 15%
Vulcan.....23¢ 21¢ 20¢ 19¢ 18¢..12½&5%
Northwest'n.25¢ 23¢ 22¢ 21¢ 20¢. 10&10&5&5%
Globe .....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
Boston.....23¢ 21¢ 20¢ 19¢ 18¢..20&2½%
A. C.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
C. B.-K.....25¢ 23¢ 22¢ 21¢ 20¢. 25&10@33⅓&5%
Champlain .28¢ 6¢ 25¢ 24¢ 23¢. 25&10&10%
New Haven..28¢ 26¢ 25¢ 24¢ 23¢. 25&10@25&10&10%
Saranac.....23¢ 21¢ 20¢ 19¢ 18¢...30&10%
Champion ...25¢ 23¢ 22¢ 21¢ 20¢. 10&10&10%
Capewell.....28¢ 26¢ 25¢ 24¢ 23¢. 35&5@35&10%
Star.....23¢ 21¢ 20¢ 19¢ 18¢. 10&10@10&12½%
Anchor.....23¢ 21¢ 20¢ 19¢ 18¢.....35%
Western.....23¢ 21¢ 20¢ 19¢ 18¢...40&10%
Empire Bronzed.....14 ₱ lb.

Horse Shoes—See Shoes Horse.

Hose, Rubber—
Competition..... 75&10@75&10&5%
Standard..... 70&70&10%
Extra.....60@60&10%
N. Y. B. & P. Co., Para.....30&10%
N. Y. B. & P. Co., Extra.....50%
N. Y. B. & P. Co., Dundee.....60&10&5%

Huskers—
Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper.....₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—25%.
Spittoons, No. 2, ₱ doz.....$9.00
Basins, Ringed, ₱ doz., No. 1, $4.80; No. 2, $4.20; No. 3.....$3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest.....$7.50
Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest.....$3.70
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest.....$2.25
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₱ set.....$4.00
Dry Measures, 1, 2, 4, 8 and 16 qts. (5 pieces), ₱ set.....$3.00
See also *Pails.*

Jack Screws—See Screws.

Kettles—

	Spun.	Stamped.
Brass, 7 to 17 in., ₱ ℔....	24¢	21 ¢
Brass larger than 17 in., ₱ ℔.....	26¢	23½¢

Enameled and Tea Kettles. See *Hollow-Ware.*

Keys—
Lock Asso'n list Dec. 30, 1886...50&10@ 60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—
Parkin's.
Applewood Handles...₱ doz $6.00, 40%
Rosewood or Cocobolo.₱ doz $9.00, 40%

Knives—
Wilson's Butcher Knives.....25@30%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Nichols' Butcher Knives.....40&10%
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....20%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn, Auburn Mfg. Co. Crescent.....$3.50

Knobs—
Door Mineral.....65@68%
Door Por. Jap'd.....75@78%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....30&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%

Ladles.—
Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10&40%
Melting, Warner's.....30%

Lanterns—
Tubular—
Plain with Guards, ₱ doz.....$4.00@4.25
Lift Wire, with Guards.....$4.50@4.75
Square Plain, with Guards.....$4.00@4.25
Sq. Lift Wire, with Guards.....$4.25@4.50
Without Guards, 25¢ ₱ doz less.
Miscellaneous.
Police, Small, $6.00; Medium, $7.25; Large, $9.75.....20@25%

Lawn Mowers—
Standard List.....50&10%
Quaker City.....60&10%
Enterprise.....60&10%

Lemon Squeezers—
Porcelain Lined, No. 1....₱ doz $6.00, 25&30%
Wood, No. 2.....₱ doz $3.00, 35%
Wood, Common.....₱ doz $1.70@1.75
Dunlap's Improved .....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $0; 12, $18 ₱ doz.....25&10%
Jennings' Star.....₱ doz $2.50
The Boss.....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90
Little Giant.....50@50&5%
King.....40&5%

Lines—
Cotton and Linen Fish, Draper's.....50%
Draper's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson, Cotton, No. 4, $2; No. 4½, $2.50; No. 5, $3.00.....10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.....
Mason's Colored Cotton.....45%
White Clothes.. Nos. 18 10 20
$3.60 $3.00 $2.5
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 20%

Locks, &c.—
Door Locks, Latches, &c.
R. & E. Mfg. Co., list Mar. 20, 1889. } 60&10@60 &10&10%
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co..list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.....
Note.—Lower net prices often made.
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
F. Many's "Extension Cylinder" $10.50 ₱ doz.
Barnes Mfg. Co.....40&40&10%
Yale.....net prices
Deitz Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Shepardson or U. S.....35%
Felter or American.....40&10%
Seed's N. Y. Hasp Lock.....25%
Cabinet—
Eagle, Gaylord Parker and Corbin... } List March, '84, Jan. 1, '85..33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 86 to 96.....30%
Stoddard Lock Co.....30&33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40&40&10%
Eagle and Corbin Trunk.....25&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%
Padlocks—
List Dec. 23, '84.....75@75&10%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505..15%
A. E. Deitz.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....45%
Horseshoe.....₱ doz, $9. 40&40&10%
Barnes Mfg. Co.....40&40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90&90&10%
E. T. Fraim's Keystone Scandavian: Nos. 119, 120, 139 and 140.....90&10% Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%

Lumber Tools.
Ring Peavies, "Blue Line"...₱ doz $20.00
Ring Peavies, Common.....₱ doz $18.00
Steel Socket Peavies.....₱ doz $21.00
Mall. Iron Socket Peavies....₱ doz $19.00
Cant Hooks, "Blue Line"...₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₱ doz $18.00

Lustro—
Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Mallets—
Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Match Safes—
Dangerfield's Self-Igniting...₱ doz $1.5

Mattocks. Regular list.....60@60&10%

Meat Cutters—
Dixon's ₱ doz.....40&5%

Nos.....	1	2	3
	$14.00	$17.00	$0.00

Woodruff's ₱ Doz.....40&5%

Nos...	100	150
	$15.00	$18.00

Champion ₱ doz.....40&45%

Nos.....	200	300	400
	$22.00	$27.00	$40.00

Hales Pattern ₱ doz.....70&70&5%

Nos.....	11	12	13
	$27.00	$33.00	$45.00

American.....30%

Nos.....	1	2	3	4	5
Each.....	$5	$7	$10	$25	$50

					$60

Enterprise.....30%

Nos.....	10	12	22	32	42
Each.....	$3	$2.50	$4	$6	$15

Pennsylvania.....40&10%

Nos.....	1	2	3	00
₱ doz....	$24.00	$28.00	$36.00	$28.00

Miles' Challenge ₱ doz.....45@45&10%

Nos.....	1	2	3
	$32.00	$30.00	$40.00

Home No. 1.....₱ doz, $26.00, 55&10%
Draw Cut, each:

Nos.....	2	6	8
	$60	$75	$80	$225	20@25%
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Beef Shavers (Enterprise).....20&10@30%
Chadborn's Smoked Beef Cutter. ₱ doz $66.00

Mincing Knives—
Am. (2d quality, ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00; Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adirondack.....₱ doz. $3.00 25%

Molasses Gates—

Stebbin's Pat..... 75%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....20%
Lincoln's Pattern.....70&70&10
Weed's.....20&10%

Boss, ₱ doz:
Nos. 1, $7; No. 2, $8; No. 3, $9; No. 4 $10.....60&10&10%

Money Drawers....₱ doz, $18@$20

Muzzles—

Safety.....₱ doz, $3.00, 25 %

Nails, see Trade Report.

Wire Nails, Papered.
Association list, July 15, 1889.....70&10@70&10&5%
Tack Mfrs.' list.....70c70&5%
Wire Nails, Standard Penny, Card June 1, '89, base.....$2.50@$2.65

Nail Puller—

Curtiss Hammer.....₱ doz $9.00
Giant, No. 1.....₱ doz. $30.00, 10%
Pelican.....₱ doz, $9.00, 25%
Boss.....₱ doz, $30.00, 30%
Lightning.....₱ doz $21.00

Nail Sets—

Square.....₱ gr., $4.00@$4.25
Round.....₱ gr. $3.25
Cannon's Diamond Point...₱ gr.,$12, 20%

Nut Crackers—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₱ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Nuts—

Nuts, off list Jan. 1, 1888: Square. Hex.
Hot Pressed..... 5.4¢ 5.9¢
Cold Punched..... 5.4¢ 5.5¢
In lots less than 100 ℔, ₱ ℔, add ½¢; 1-℔ boxes, add 1¢ to list.

Oakum—

Government.....₱ ℔ 7½@7¾ ¢
U. S. Navy.....₱ ℔ 6¾@6¾¢
Navy.....₱ ℔ 5½@5¾¢

Oilers—

Zinc and Tin.....65@65&10%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $5.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&10%
Malleable, Hammers, Old Pattern, same list.....40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Gem P. D. & Co.....₱ gro. $2

Packing, Steam—
Rubber—

Standard.....60&10@60&10&10%
Extra.....50&10@60%
N. Y. B. & P. Co., Standard...50&10&5%
N. Y. B. & P. Co., Empire.....70%
N. Y. B. & P. Co., Salamander, ₱ ℔ 65¢, 30%
Jenkins' Standard.....₱ ℔ 80¢, 35%

Miscellaneous—

American Packing.....10¢@11¢ ₱ ℔
Russia Packing.....14¢ ₱ ℔
Italian Packing.....13¢@14¢ ₱ ℔
Cotton Packing.....15¢@17¢ ₱ ℔
Jute.....7¢@8¢ ₱ ℔

Padlocks—

See Locks.

Pails—

Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Sidney Shepherd & Co.	2.80	3.00	3.40
Iron Clad	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25 %

Star Pails, 12 qt.....₱ doz $6.00
Fire, Stable and Milk, 14 qt..₱ doz $7.80

Standard Fibre Ware—

	Plain.	Deer'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....40&10%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60 & 60&10%

Picture Nails—

Brass Head, Sargent's list.....50&10&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list..40&10%
Niles' Patent.....40%

Pinking Irons— ₱ doz 65¢ net

Pipe, Wrought Iron—
List September 18, 1889.

1¼ and under, Plain.....50%
1¼ and under, Galvanized.....42½%
1½ and over, Plain.....62½%
1½ and over, Galvanized.....50%
Boiler Tubes, Iron.
1¾ and under.....50%
2 in. and larger.....55%

Planes and Plane Irons—
Wood Planes—

Molding.....50&10&60%
Bench, First Quality.....60&60&5%
Bench, Second Quality.....60&10&10&70%
Bailey's (Stanley R. & L. Co.).....40&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40&10%
Miscellaneous Planes (Stanley R. & L. Co.).....20&10%
Victor Planes (Stanley R. & L. Co.).20&10%
Steer's Iron Planes.....35@35&5%
Meriden Mal. Iron Co.'s.30&10&30&10&10%
Davis's Iron Planes...30&10&30&10&10%
Birmingham Plane Co.....50@50&5%
Gage Tool Co.'s Self-Setting.....20&10%
Chaplin's Iron Planes.....40@40&5%
Sargent's.....30&10@30&10&10%

Plane Irons—

Plane Irons.....20&10%
Plane Irons, Butcher's...$5.00@$5.25 to £
Plane Irons, Buck Bros.....30%
Plane Irons, Auburn Tool Co., "Thistle".....40%
Sandusky Tool Co.:
Single and Cut.....30%
Double.....40%
L. & I. J. White.....25%

Pliers and Nippers—

Button's Patent.....30&10@40%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₱ doz.....20&10@33⅓%
Humason & Beckley Mfg. Co..50@50&10%
Gas Pliers.....50%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P. S. & W. Cast Steel.....50%
P. S. & W. Tinners' Cutting Nippers, add 6⅔ dis 10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00.....30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 40@40&5%

Plumbs and Levels—

Regular List.....70&10@70&10&10%
Disston's.....45&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis' Inclinometers.....10&10%

Polish, Metal.

Prestoline.....20&10%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Pokes, Animal—

Bishop's I. X. L.....₱ doz $6.50
Bishop's O. K.....₱ doz $5.50
Bishop's Pioneer.....₱ doz $3.75
Bishop's American.....₱ doz $3.00

Poppers, Corn—

Round or Square, 1 qt..₱ gr $12.00@15.00
Round or Square, 2 qt..₱ gr $25.00@26.00

Post Hole and Tree Augers and Diggers—

Samson Post Hole Digger, ₱ doz $36.00. 25&10%
Fletcher Post Hole Augers, ₱ doz $36, 20%
Eureka Diggers.....₱ doz $16.00@17.00
Leed's.....₱ doz $8.00@9.00
Vaughan's Post Hole Auger, ₱ doz $13.00@14.00
Kohler's Little Giant.....₱ doz $18.00
Kohler's Hercules.....₱ doz $15.00
Kohler's New Champion.....₱ doz $9.00
Schneidler.....₱ doz $18.00
Ryan's Post Hole Diggers...₱ doz $24.00
Cronk's Post Bars, ₱ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger, ₱ doz $30.00, 50%
Imperial, ₱ doz, $15.....45%

Potato Parers—

White Mountain.....₱ doz $5.00@5.50
Antrim Combination.....₱ doz $8.00
Hoosier.....₱ doz $13.50

Pruning Hooks and Shears—

Disston's Combined Pruning Hook and Saw.....₱ doz $18.00, 20&10%
Disston's Pruning Hook, ₱ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools.....40%
Pruning Shears, Henry's Pat, ₱ doz $3.75@4.00 net
Henry's Pruning Shears, ₱ doz $4.25@4.50 net
Wheeler, M. & C. Co.'s Combination, ₱ doz $12.00, 20%
Dunlap's Saw and Chisel, ₱ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, 7.25

Pulleys—

Hot House, Awning, &c.....60&10%
Japanned Screw.....60&10%
Brass Screw.....60&10%
Japanned Side.....66⅔&10%
Japanned Clothes Line.....60&10%
Empire Sash Pulley.....55@60%
Moore's Sash, Anti-Friction.....50%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70.....50%
Hay Fork, "F" Common and Pat. Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating...60%
Shade Rack.....45%
Tackle Blocks.....See Blocks
Moore's Anti-Friction 5 in. Wheel, ₱ doz $12.00.....40%

Pumps—

Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers..67½@70%
Pitcher Spout, Cheaper Goods.70@70&5%

Punches—

Saddlers' or Drive, good, ₱ doz...60@65¢
Bemis & Call Co.'s Cast Steel Drive..50&5%
Bemis & Call Co's Springfield Socket.50&5%
Spring, good quality....₱ doz $2.50@2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring and Check..40%
Solid Tinners'.....₱ doz $1.44, 55%
Tinners' Hollow Punches.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—

Sliding Door, Wr't Brass, ₱ ft 35¢.....15%
Sliding Door, Bronzed Wr't Iron, ₱ ft, 7¢
Sliding Door, Iron, Painted, ₱ foot 4¢, 40%
Barn Door, Light. In. ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%

B. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 feet	$2.15	2.70	3.25. net

Terry's Steel Rail, ₱ foot.....4½¢
Victor Track Rail, 7¢ ₱ foot.....50&2%
Carrier Steel Rail, ₱ foot.....4½¢
Moore's Wrought Iron.....25%

Rakes—

Cast Steel, Association goods.....70%
Cast Steel, outside goods.....60&10@70%
Malleable.....70@70&5%
Gibbs Lawn Rake.....$12.00, 50&15%
Canton Lawn Rake.....$9.00, 50&10%
Ft. Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—

J. R. Torrey Razor Co.....20%
Wostenholme and Butcher, $10.00 to £, 10%

Razor Strops—

Genuine Emerson.....60@60&5%
Imitation "....₱ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₱ doz $2.00
Lamont Combination.....₱ doz $4.00

Rivets and Burrs—

Iron, list Nov. 17, '87.....50%
Copper.....50&10@60%

Rivet Sets.....50&10%

Rods—

Stair, Brass.....25&2%
Stair, Black Walnut.....₱ doz 40¢

Rollers—

Barn Door, Sargent's list.....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%

Rope—

Manufacturers' prices for large lots:
Manila..¼ in. and larger ₱ ℔ 13¼¢
Manila.....⅜ in. ₱ ℔ 13¾¢
Manila.....¼ and 5-16 in. ₱ ℔ 14 ¢
Manila Tarred Rope.....₱ ℔ 12¾¢
Manila, Hay Rope.....℔ ℔ 13¼¢
Sisal...¼ inch and larger ₱ ℔ 11¼¢
Sisal.....⅜ in. ₱ ℔ 11¾¢
Sisal.....¼ and 5-16 in. ₱ ℔ 12 ¢
Sisal, Hay Rope.....₱ ℔ 11¼¢
Sisal, Tarred Rope.....₱ ℔ 10¾¢
Sisal, Medium Lathe Yarn.₱ ℔ 10¾¢
Cotton Rope.....₱ ℔ 15@18¢ net
Jute Rope.....₱ ℔ 8¢

1½% for cash in 10 days.

Rules—

Boxwood.....80&10&10@80&10&10&5%
Ivory.....50&50&10%
Starrett's Rules and Straight Edges, Steel.....25&10%

Sad Irons—

From 4 to 10, at factory...₱ 100 ℔, $2.40@$2.55
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Gleason's Shield and Toilet.....25%
Mrs. Pott's Irons.....40@40&10%
Enterprise Stove Irons.....40%
Cox, Combined Fluter and Sad Iron, ₱ doz $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8½¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible.....30@20&5%
National Self-Heating.....30 %

Sand and Emery Paper and Cloth—

List April 19, 1886.....50@50&10%
Sibley's Emery and Crocus Cloth.....30%

Sash Cord—

Common.....₱ ℔, 10@11¢
Patent, good quality.....₱ ℔ 13@13½¢
White Cotton Braided, fair..₱ ℔ 28@29¢
Common Russia Sash.....₱ ℔ 13½¢
Patent "....₱ ℔ 15¢
Cable Laid Italian Sash.....₱ ℔ 22¢@23¢
India Cable Laid "....₱ ℔ 13¢

Silver Lake—
A Quality, White, 50¢.....10&10&5%
A Quality, Drab, 55¢.....10&10&5%
B Quality, White, 50¢.....20&10&5%
B Quality, Drab, 55¢.....20&10&5%
C Quality, White (only).....26½¢@28¢
Sylvan Spring, Extra Braided, White, 34¢
Sylvan Spring, Extra Braided, Drab..30¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....25¢

Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢....30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%

Sash Locks—

Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's "....33⅓%
Morris and Triumph, list Aug. 16, 1886, 60&2%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60@60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60@60&10%
Lieseche's, Nos. 100 and 110, ₱ gr $8; 105, $10.00.....20&10%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list March 1, 1888 55@55&5%
Security.....70%
Buckeye.....₱ gro $4.80

Sash Weights—

Solid Eyes.....₱ ton $22.00

Sausage Stuffers or Fillers—

Miles' "Challenge," ₱ doz $20, 50@50&5%
Perry.....₱ doz, No. 1, $15.00; No. 0, $21.00.....50&5&50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co.....20&10@30%
Silver's.....40&10%

Saws—

Disston's Circular.....45@45&5% | Extras sometimes given by jobbers.
Disston's Cross Cuts.....45@45&5%
Disston's Hand 25@25&5%
Atkins' Circular Shingle and Heading 50&10%
Atkins' Silver Steel Diamond X Cut, ₱ foot 70¢
Atkins' Special Steel Dexter X Cuts ₱ foot 50¢
Atkins' Special Steel Diamond X Cuts ₱ foot 30¢
Atkins' Champion and Electric Tooth X Cuts.....₱ foot 24@25¢
Atkins' Hollow Back X Cuts..₱ foot 18¢
Atkins' Mulay, Mill and Drag.....40&10%
Atkins' One-Man Saw, with handles, ₱ foot 32¢
W. M. & C., Hand.....30&5@30&10%
W. M. & C., Champion X Cuts, Regular.....₱ foot 24@28¢
W. M. & C. X Cuts, Thin Back..... ₱ foot 27¢@29¢
Peace Circular and Mill.....45&10%
Peace Hand Panel and Rip 20&10@20&10&10%
Peace Cross Cuts, Standard...₱ foot 25¢
Peace Cross Cuts, Thin Back ₱ foot 27@28¢
Richardson's Circular and Mill 45@45&10%
Richardson's X Cuts, No. 1, 39¢; No. 2, 27¢; No. 3, 24¢

Hack Saws—

Griffin's, complete.....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades.....25%
Diamond Huck Saws and Blades.....25%
Eureka and Crescent.....25%

Saw Frames—

White Vermont.....₱ gro $9.00@10.00
Red, Polished and Varnished.....₱ doz $1.50, 25%

Saw Sets—

Stillman's Genuine...₱ doz $5.00@7.75, 40&5%
Stillman's Imita.....₱ doz $3.25@5.25, 40&5@40&10%
Common Lever.....₱ doz $2.00, 40&5%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10@50%
Leach's...No. 0, $8.00; No. 1, $15, 15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer.....30&5%
Bemis & Call Co.'s Plate.....10%
Bemis & Call Co.'s Cross Cut.....12½%
Aiken's Genuine.....$13.00, 50&10%
Aiken's Imitation.....$7.00, 55&5%
Hart's Pat. Lever.....20%
Disston's Star, #9, No. 15, $5.50; 20&10@20&10&10%
Atkin's Lever, ₱ doz No. 1, $6.00; No. 2, $9.00
Atkin's Criterion.....₱ doz $7.50
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10%
Avery's Saw Set and Punch.....50%
Am. Tool Co.'s Superior.....₱ doz $15,50%

Saw Tools—

Atkins' Perfection.....₱ doz $15.00
Atkins' Excelsior.....₱ doz $6.00
Atkins' Giant.....₱ doz $4.00

Scales—

Hatch, Counter, No. 171, good quality, ₱ doz $21.00
Hatch, Tea, No. 161....₱ doz $6.75@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.20@2.30
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....20%
Family, Turnbulls.....30@30&10%
Riehle Bros.' Platform.....40%

Scale Beams—

Scale Beams, List Jan. 12, '82...50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50.....30&10%
Box, 1 Handle.....₱ doz $4.00, 10%
Box, 2 Handle.....₱ doz $6.00, 10%
Defiance Box and Ship.....20&10%
Foot.....50&10@60%
Ship, Common.....₱ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—

Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons....33⅓% 33⅓&10%
Stearns' Frames and Corners.25@25&10%

Screw Drivers—

Douglas Mfg. Co.....20&10&10%
Disston's.....45&10%
Disston's Pat. Excelsior.....45&10%
Buck Bros.....30%
Stanley R. & L. Co.'s Varnished Handles.....65&10%
Black Handles.....60&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....66⅔&10&10%
Knapp & Cowles' No. 1.....60&20&70%
No. 1 Extra.....60@60&10%
Nos. 00 & 4.....50&5&50&10&5%
Stearns'.....25&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₱ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw Driver Bits.....₱ doz 50c75¢
Screw-Driver Bits, Parr's.....₱ gro $6.25
Fray's Hol. Hdle. Sets. No. 3, $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....20&10%
Brace Screw-Drivers.....25&10%

Screws—

Wood Screws—List March 1, 1889

Flat Head Iron.....50%
Round Head Iron....40%
Flat Head Brass.....45%
Round Head Brass...35%
Flat Head Bronze....45%
Round Head Bronze.35%

Extra 5 @ 10 % often given

Machine—
Flat Head, Iron.....55%
Round Head, Iron.....50%
Bench and Hand—
Bench, Iron.....55&10@55&10@10%
Bench, Wood, Beech.....₱ doz $2.25
Bench, Wood, Hickory.....20@10%
Hand, Wood.....25&10@25&10@5%
Lag, Blunt Point, according to size.....75&10@80%
Coach and Lag, Gimlet Point.....75%
Bed.....25&5%
Hand Rail, Sargent's.....66⅔&10%
Hand Rail, H. & B. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co.....75%
Jack Screws, Millers Falls list..50@50&5%
Jack Screws, P. S. & W.....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'.....40@40&10%

Scroll Saws—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cabinet Makers', $15.....25%
Barnes' Scroll Saw Blades.....35%

Scythe Snaths..50&5&2@5&10&2%

Shears—
American (Cast) Iron...75&10@75&10&5%
Pruning...See Pruing Hooks and Shears.
Barnard's Lamp Trimmers...₱ doz $3.75
Tinners'.....20&2%
Seymour's, List, Dec., 1881.....60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881.....60&10&10@60&10&10&5%
Heinisch's Tailor's Shears.....33⅓%
First quality C. S. Trimmers..80@80&10%
Second quality C. S. Trimmers.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Chicago Drop Forge & F. Co., Solid Steel Forged.....60%
Clauss Shear Co., Japanned.....70%
Clauss Shear Co., Nickeled, same list..60%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888..50&10@60&10%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2%
Moore's Anti-Friction.....50%
Sliding Shutter—
R. & E. list Dec. 18, 1885.....60&10&2%
Sargent's list.....60&10%
Reading list.....60&10&10%

Ship Tools—
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, at factory. $4.00
Mule—
Add $1 ₱ keg to above prices.
Ox, Wrought—
Ton lots.....₱ ℔ 9¢
1000 ℔ lots.....₱ ℔ 9½¢
500 ℔ lots.....₱ ℔ 10¢

Shot—
(*Eastern prices 2¢ off, cash, 5 days.*
Drop, ₱ bag, 25 ℔.....$1.21
Drop, ₱ bag, 5 ℔.....30
Buck and Chilled, ₱ 25-℔ bag.....1.46
Buck and Chilled, ₱ 5-℔ bag.....35

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S.....60@60&10%
Griffith's Solid C. S. R. R. Goods.....20%
Old Colony (Sanford Fork & Tool Co).20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.....20@20&7½%
Lehigh Mfg. Co.....50&10%
Payne Pettebone & Son, list January, 1886.....30%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron.....50&10%
Rowland's Steel.....60&5@60&10%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head.....60&10&10%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel, list Nov. 1, 1887.20%
Coldbrookdale Iron Co.....50&10%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....35%

Sieves—
Buffalo Metallic, S. S. & Co...50&25&10%
Shaker (Barler's Pat.) Flour Sifters.....₱ doz $2.00; ₱ gr $21.00
Electric.....₱ gr $18.00
Hunter's.....₱ doz $2.00
Smith's Adjustable Sifters.....₱ doz $2.00
Smith's Adjustable Milk Strainer. ₱ doz $2.00
Smith's Adjustable T. & C. Strainer. ₱ doz. $1.25
Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ₱ doz..	70¢	90¢
Mesh 20, Nested, ₱ doz..	85¢	$1.00
Mesh 24, Nested, ₱ doz..	$1.00	1.10

Slates—
School, by case.....40%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&2%
Covert, New Patent.....50&5&2%
Covert, New R. E.....60@10&2%
Covered Spring.....60&10&10%

Soldering Irons—
Covert's Adjustable, list Jan. 1, 1886. 35&2%

Spoke Shaves—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....20&10@30%
Cincinnati.....25&10%

Spoke Trimmers—
Bonney's.....₱ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'.....₱ doz $9.00, 20%
Cincinnati.....25%

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list...70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo S. S. & Co.....33⅓&2%
Silver-Plated—(4 mos. or 5% cash 30 days).
Meriden Brit. Co., Rogers.....50%
C. Rogers & Bros.....50%
Rogers & Bro.....50%
Reed & Barton.....50%
Wm. Rogers Mfg. Co.....50&10@60%
Simpson, Hall, Miller & Co.....50&10
Holmes & Edwards Silver Co...60&60&5%
L. Boardman & Son.....50&10%
Miscellaneous.
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50%
No. 49 Nickel Silver.....50&10
German Silver.....50&50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5&50&10&5% cash
Britannia.....60%
Boardman's Nickel Silver.....50 } mos
Boardman's Britannia Spoons, case lots.....60 } 4

Springs—
Elliptic, Concord, Platform and Half Scroll.....60&60&5%
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron..... } 75&10@80%,
Nickel-Plated..... } full cs. ex. 10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels.45&10%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Standard Fibre Ware—

	Per Dozen. Plain.	Dec'r'd
Wash Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11¼ in.....		4.00
Cuspidors.....		8.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also Pails.

Staples—
Fence Staples, Galvanized. } Same price
Fence Staples, Plain..... } as B'rb Wire
See Trd. Rep.

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's
Waterford Goods.....30&5@30&10%
Butterfield's Goods.....30&5@30&10%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates....33⅓&5@40%
Reversible Ratchet.....30%
Gardner.....25%

Stone—
Hindostan No. 1, 3¢; Axe, 3½¢; Slips No. 1, 4½¢
Sand Stone.....₱ ℔ 2½¢
Washita Stone, Extra.....₱ ℔ 19@20¢
Washita Stone, No. 1.....₱ ℔ 14@15¢
Washita Stone, No. 2.....₱ ℔ 10@11¢
Washita Slips, No. 1, Extra..₱ ℔ 36@38¢
Washita Slips, No. 1.....₱ ℔ 24@25¢
Arkansas Stone, No. 4 to 8 in₱ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₱ ℔ $1.35
Turkey Oil Stone, 4 to 8 in.....₱ ℔ 40¢
Turkey Slips.....₱ ℔ $1.00@1.50
Lake Superior, Chase.....₱ ℔ 16¢
Lake Superior Slips, Chase...₱ ℔ 31@32¢
Seneca Stone, Red Paper Brand....₱ ℔ 18@20¢
Seneca Stone, High Rounds..₱ ℔ 20@25¢
Seneca Stone, Small Whets..₱ gro $24.00

Stove Polish—
Joseph Dixon's.....₱ gro $6.00,10%
Gem.....₱ gro $4.50, 10%
Gold Medal.....₱ gro $6.00, 25%
Mirror.....₱ pro $6.00, —%
Lustro.....₱ gro $4.75
Ruby.....₱ gro $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ ℔ $5.00
Boynton's Noon Day, ₱ gro.....13.00
Parlor Pride Stove Enamel..₱ gro $ cans
Yates' Liquid, 2 3 5 10 gal...8¢
₱ gal ...$0.90 .80 .70 .60
Yates Standard Paste Polish, 10-℔ cans, ₱ ℔ 15¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish..₱ gro $9.00
Bonnell's Paste Stove Polish..₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00

Tacks, Brads, &c.—
List, Jan. 2, 1888.—(*Note.*—Some manufacturers are selling Tacks at slightly higher prices than those named):
American Iron Carpet, Blued.....80%
American Iron Carpet, Tinned.....80&10&10%
Steel Carpet, Blued.....80%
Steel Carpet, Tinned.....80&10&10%
Swedes Iron Carpet, Blued.....80%
Swedes Iron Carpet, Tinned..80&10&10%
American Iron Cut.....75&75&10&5%
Swedes Iron.....75&5@75&10&5%
Swedes Iron, Upholsterers', 75&10@80%
Tinned Swedes Iron.....75&10@80%
Tinned Swedes Iron, Upholsterers', 75&10@80%
Gimp and Lace.....75&10@80%
Tinned Gimp and Lace.....75&10@80%
Swedes Iron Trimmers'.75&10@75&10&5%
Swedes Iron Miners'...75&10@75&10&5%
Swedes Iron Bill Posters' or Railroad, 75&10@75&10&5%
Swedes Steel (Swedes Iron price list), 80@80&5%
Copper Tacks.....50&10%
Copper Finishing, Trunk and Clout Nails.....50&10%
Finishing Nails.....75@75&5%
Trunk and Clout Nails.....70&10%
Tinned Trunk and Clout Nails ...70&10%
Basket Nails.....70&10%
Common and Patent Brads .....70&10%
Hungarian Nails.....70&10%
Chair Nails.....70&10%
Zinc Glaziers' Points.....50@50&5%
Cigar Box Nails.....50&10@50&10&5%
Picture-Frame Points..50&10@50&10&5%
Looking-Glass Tacks...50&10@50&10&5%
Leathered Carpet. .....50&10@50&10&5%
Brush Tacks.....50&10@50&10&5%
Shoe Finders,' List Jan 2, 1888, 10&10&5 10&10&5%
Lining and Saddle Nails, List Jan. 1, 1886:
Silvered.....30&10&10%
Japanned.....20&10&10%
Double-Pointed Tacks.....85%
Wire Carpet Nails.....50&10%
Wire Brads & Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%

Tap Borers—
Common and Rind.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Tapes, Measuring—
American.....33⅓@33⅓&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See Skeins.

Ties, Bale- Steel
Standard Wire, list.....50&10&5%

Tinners' Shears, &c.—
Shears and Snips (P. S. & W.).....20@25%
Punches, see Punches.
Snips, J. Mallinson & Co.....33⅓%

Tinware—
Stamped, Japanned and Pierced, list Jan. 20 1887.....75@75&5

Tire Benders, Upsetters, &c—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender 15%

Tobacco Cutters—
Champion.....20&10@30%
Wood Bottom.....₱ doz $5.00@$5.25
All Iron.....₱ doz $4.25
Nashua Lock Co.'s ₱ doz, $18.00 50@55%
Wilson's.....55%
Sargent's.....₱ doz, $24, 55&10%
Acme.....₱ doz, $20.00,40%

Transom Lifters—
Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....35%
Skylight Lifters.....35%
Crown, Eagle and Shield.....50%
Reiher's, list Jan. 1, 1887-
Bronzed Iron Rods.....50&10&2
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's Universal.....40@40&10%

Traps—
Game—
Newhouse.....40@40&5%
Onelda Pattern.....70@70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₱ doz holes, 11@12¢
Mouse, Round Wire.....₱ doz $1.50, 10%
Mouse, Cage, Wire.....₱ doz $2.50, 10%
Mouse, Catch-'em-alive....₱ dz $2.50, 15%
Mouse, Bonanza.....₱ gr $10.00
Mouse Delusion.....₱ gr $15.00
Rat, Decoy.....₱ gr $10.00, 10%
Ideal.....₱ gr $10.00
Cyclone.....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz 90¢
In full cases.....₱ doz 75¢

Trowels—
Lothrop's Brick and Plastering.25@25&5%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering, 25@25&10%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering 20%
Garden.....70%

Triers—
Butter and cheese.....25%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '82.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	B.
No. 9, ¼ and ½ ℔ Balls	22¢	30¢
No. 12, ¼ and ½ ℔ Balls	21¢	29¢
No. 18, ¼ and ½ ℔ Balls	18¢	28¢
No. 24, ¼ and ½ ℔ Balls	18¢	28¢
No. 36, ¼ and ½ ℔ Balls	16¢	27¢
No. 264, Mattrass, ¼ and ½ ℔ Balls.	18@50¢	
Chalk Line, Cotton, ½ ℔ Balls		25¢
Mason Line, Linen, ½ ℔ Balls		50¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)		11½¢
3-Ply Hemp, 1 ℔ Balls	12¢@12½¢	
3-Ply Hemp, 1½ ℔ Balls	11¢@11½¢	
Cotton Wrapping, 5 Balls to ℔	15¢@16¢	
2, 3, 4 and 5-Ply Jute, ½ ℔ Balls	10¢	
Wool	6½¢@6¾¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ℔ to doz.	18¢	

Vises—
Solid Box.....60@60&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....35%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40@50@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....60%&10%
Hopkins'.....₱ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Combination Hand Vises.....₱ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....20&10%

Wagon Boxes—
Per ℔.....2½¢

Wagon Jacks—
Daisy.....25%

Washer Cutters—
Smith's Pat.....₱ doz $12.00, 20&10&10%
Johnson's.....₱ doz $11.00, 33⅓%
Penny's, ₱ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₱ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Washers—

Size.....	⅛	5-16	⅜	½	⅝	¾	1
Washers....	6½	5½	4½	3½	3	3	3

In lots less than 200 ℔, ₱ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₱ ℔ 3½¢
Steel.....₱ ℔ 4 ¢

Well Buckets, Galvanized—
Hill's.....₱ doz, 12 qt, $4.25; 14 qt, $5.25
Iron Clad.....₱ doz, 14 qt, $4.25@$4.50
Whiting's Flat Iron Band.....$4.25@4.50
Whiting's Wired Top..₱ doz $4.00@.4.25

Well Wheels—
8 in., $2.25; 10 in., $2.70; 12 in., $3.25

Wire—
Iron—
Market,
Br. & Ann., Nos. 0 to 18.....75%
Cop'd, Nos. 0 to 18.....70%
Galv., Nos. 0 to 18.....25%
Tin'd, Tinned list Nos. 0 to 18.....66⅔%
Stone,
Br. and Ann'd, Nos. 16 to 18, 72½@72½&5%
Bright and Ann'd, Nos. 19 to 26....75%
Br. and Ann'd, Nos. 27 to 36....75&10%
Tinned.....70@70&10%
Tinned Broom Wire.....70@70&10%
Galvanized Fence.....62½@65%
Annealed Fence, Nos. 8 and 9.....70&10%
Annealed Grade, Nos. 10 to 14....70&10%
Brass, list Jan. 18, 1884.....25@30%
Copper, list Jan. 18, 1884.....30 @ 35%
Barb Fence.....See Trade Report
Wire on Spools.....65%
Malin's Steel and Tin'd Wire on Spools, 60%
Malin's Brass and Cop. Wire on Spools50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, Nos. 12 to 30..55¢ ₱ Picture Wire.....New list, 50%
Barb Wire Safety Guards, ₱ 1000, $9.00, 25%
Wire Clothes Lines, see Lines.

Wire Cloth, Netting, &c.
Painted Screen Cloth, good quality, ₱ 100 sq. ft., $1.80 @ $1.90
Galvanized Wire Netting....75@75&5%

Wire Goods—
See Bright Wire Goods.

Wire Rope—
List May 1, 1886.
Iron.....30%
Cast Steel.....40%

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....55&3%
Coes' "Mechanics".....55&10&3%
Girard Standard.....70&10%
Machinists', Sterling Wrench Co..70&10%
Lamson & Sessions' Engineers'...60&10%
Lamson & Sessions' Standard.....70&10%
Goes' Pattern, Wrought..... } 75&10&5
Girard Agricultural..... } @ 80%
Lamson & Sessions' Agric't.. }
Sterling Wrought.....
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₱ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....60&3%
Acme, Nickeled.....50&3%
Walker's.....55&3%
Diamond Steel.....55&3%
Cincinnati Brace Wrenches.....15&10%
Cincinnati Monkey Wrenches ..15&10%

Wringers, Clothes—
List March 11, 1889, 2% cash.

Wrought Goods—
Staples, Hooks, &c., list Jan. 12, 1886, 80&20@80&35%

CURRENT METAL PRICES.

OCTOBER 9, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:
⅜ to 2 in. round and square.. } ₩ lb 1.90 @ .. ¢
1 to 6 in. x ⅜ to 1 in..... ....
Refined Iron:
⅜ to 2 in. round and square.. }
1 to 4 in. x ⅜ to 1½ in..... } ₩ lb 2.00 @ 2.10¢
4½ to 6 in. x ⅜ to 1 in ..... }
1 to 6 in. x ¼ and 5-16 ..... ₩ lb 2.20 @ 2.30¢
Rods—⅜ and 11-16 round and sq..₩ lb 2.10 @ 2.20¢
Bands—1 to 6 x 3-16 to No. 12 ....₩ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price..₩ lb 3.00 @ ....¢
Burden's "H. B. & S." Iron, base price... ₩ lb 2 80 @ ....¢
"Ulster"..... ₩ lb 3.00 @ ....¢
Norway Rods ... .4.00 @ 5.00¢

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.... ..... 2½¢
Best Cast Steel, base price in small lots 8 ¢
Best Cast Steel Machinery, base price in small lots..... 5¢

Sheet Iron from Store.

	Common American.		R. G.	Cleaned.
10 to 16	₩ lb 2.75	@ 2.80¢	3.25	@ ....¢
17 to 20	₩ lb 2.85	@ 3 00¢	3.25	@ 3.50 ¢
21 to 24	₩ lb 3.00	@ 3.10¢	3.50	@ ....¢
25 and 26	₩ lb 3 20	@	3.50	@ ....¢
27	₩ lb 3.35	@ 3.37½¢	3.75	@ ....¢
28	₩ lb 3.50	@ .... ..¢	4.00	@ ....¢
	B. B.		2d qual.	
Galv'd, 14 to 20,	₩ lb, 4.50	@	4.88	@ ....¢
Galv'd, 21 to 24,	₩ lb, 4.87½	@	4.75	@ ....¢
Galv'd, 25 to 26,	₩ lb, 5 25	@	5.12	@ ....¢
Galv'd, 27	₩ lb, 5.62½	@	5.48	@ ....¢
Galv'd, 28	₩ lb, 6.00	@	5.85	@ ....¢
Patent Planished	₩ lb A 10¢		B, 9¢	
Russia	₩ lb 9½¢ @ 10¢			
American Cold Rolled B. B	₩ lb 5¢ @ 7¢			
Craig Polished Sheet Steel	₩ lb, 8½¢			

English Steel from Store.

Best Cast	₩ lb 15 ¢
Extra Cast	₩ lb 16½ @ 17 ¢
Swaged, Cast	₩ lb 16 ¢
Best Double Shear	₩ lb 15 ¢
Blister, 1st quality	₩ lb 12 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15 ¢
2d quality	₩ lb 14 ¢
3d quality	₩ lb 12½¢

METALS.

Tin.

	Per lb
Banca, Pigs	23 ¢
Straits, Pigs	22½¢
English, Pigs	23 ¢
Straits in Bars	23¼¢

Tin Plates.

Charcoal Plates.—Bright.

			Per box.
Melyn Grade	IC, 10 x 14..	$5.75 @	$6 00
" "	IC, 12 x 12..	6.00 @	6.25
" "	IC, 14 x 20..	5.75 @	6.00
" "	IC, 20 x 28..	12.00 @	12.50
" "	IX, 10 x 14..	7.25 @	7.50
" "	IX, 12 x 12..	7.50 @	7.75
" "	IX, 14 x 20..	7.25 @	7.50
" "	IX, 20 x 28..	15.00 @	15 50
" "	DC, 12½ x 17..	5 50 @	5.75
" "	DX, 12½ x 17..	7.00 @	7.25
Call and Grade	IC, 10 x 14..	5.75 @	6.00
" "	IC, 12 x 12..	6.00 @	6 25
" "	IC, 14 x 20..	5.75 @	6.00
" "	IX, 10 x 14..	7.25 @	7.50
" "	IX, 12 x 12..	7.50 @	7.75
" "	IX 14 x 20.	7.25 @	7.50
Allaway Grade	IC, 10 x 14..	5.00 @	5.12½
" "	IC, 12 x 12..	5.12½ @	5.25
" "	IC, 14 x 20..	5 00 @	5.12½
" "	IC, 20 x 28..	11.00 @	....
" "	IX. 10 x 14..	6.00 @	....
" "	IX, 12 x 12..	6.25 @	....
" "	IX, 14 x 20..	6.00 @	....
" "	IX, 20 x 28..	12.00 @	....
" "	DC, 12½ x 17..	4 75 @	5.00
" "	DX, 12½ x 17..	5 75 @	6.00

Coke Plates —Bright.

Steel Coke.—IC, 10 x 14, 14 x 20..	$4.75 @	$5.00
10 x 20..	7.25 @	7.50
20 x 28..	9.75 @	10.25
IX, 10 x 14, 14 x 20..	5.50 @	5.75
BV Grade.—IC, 10 x 14, 14 x 20..	4.40 @	4.60

Charcoal Plates.—Terne.

Dean Grade.—IC, 14 x 20..	$4.35 @	$4.62½
20 x 28..	8.75 @	9.25
IX, 14 x 20..	5 40 @	5.62½
20 x 28..	11.00 @	11.37½
Abecarne Grade.—IC, 14 x 20..	4.25 @	4.50
20 x 28..	8.45 @	9.00
IX, 14 x 20..	5.25 @	5.50
20 x 28..	10.50 @	10 80

Tin Boiler Plates.

IXX, 14 x 26	112 sheets.	$12 50 @ $12.75
IXX, 14 x 28	112 sheets	12 75 @
IXX, 14 x 31	112 sheets	14.25 @

Copper.

DUTY: Pig, Bar and Ingot, 4¢; Old Copper, 3¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.

Ingot.

Lake	@ 12¾¢
"Anchor" Brand	@ 12 ¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		20	20	20	21	22	23	26	28
30		72	20	20	20	21	23	25	29	...
36	96		20	20	20	22	24	28	30	....
36		96	20	20	21	23	25	29	31	....
48	96		20	20	22	24	26	30	....	....
48		96	20	20	23	25	27	31	....	....
60	96		20	20	25	27	32	....	....	....
60		96	20	21	26	....	....	....	....	....
84	96		21	22	..	....	....	....	....	....
84		96	22	23	....	....	....	....	....	....
Over 84 in. wide			23	25	....	....	....	....	....	....

All Bath Tub Sheets	16 oz.	14 oz.	12 oz.	10 oz
Per pound	$0.53	0.25	0.27	0 30

Bolt Copper, ⅝ inch diameter and over, per pound..... 20¢
Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.
Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.
Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.
Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

Copper Bottoms, Pits and Flats.

Per pound.

14 ounce to square foot and heavier..... 23¢
12 ounce and up to 14 ounce to square foot..... 24¢
10 ounce and up to 12 ounce..... 26¢
Circles less than 8 inches diameter 2 cents per pound additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.

Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each..... 8¢
Tinning sheets on one side, 30 x 60 each ..... 30¢
For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each..... 15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each ..... 12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each..... 12¢
Tinning sheets on one side, other sizes, per square foot..... 2½¢
For tinning both sides double the above prices.

Planished Brass and Copper.

14 x 48.

14 and 16 oz. and heavier..31¢. By the case...30¢ ₩ lb
12 oz. and lighter.....32¢. By the case...32¢ ₩ lb
24 x 48 and 30 x 60.
14 and 16 oz. and heavier..44¢. 12 oz.....37¢ ₩ lb

Seamless Brass and Copper Tubes.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	35	31	28	27	26	25	22
15	13	36	31	29	28	27	26	23
16	14	37	32	30	29	28	27	23
17	15	38	33	31	30	29	28	24
18	16	40	34	32	30	29	28	25
19	17	41	35	33	32	31	30	27
20	18-19	42	37	35	34	33	32	29
21	20	44	39	37	36	35	34	32
22	21	46	40	38	37	36	35	34
23	22	48	42	40	39	38	37	37
24	23	51	44	42	41	39	38	39
25	24	54	47	44	43	42	41	43

Copper, Bronze and Gilding Tube, 2¢ ₩ lb additional.

Brazed Brass Tubing. (To No. 20, inclusive.)

Above 5-16 inch to 3 inch, inclusive..... 35¢
Plain, above 3 inch..... 45¢
Plain, 5-16 inch..... 45¢
Plain, ¼ inch..... 60¢
Plain, 3-16 inch..... $1.00
Plain, ⅛ inch..... 1.50
Fancy Tubing, Brass, to No. 20, inclusive..... 43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.
Discount from list..... 25 @ 30 %

Roll and Sheet Brass.

Discount from list..... 25 @ 30 %

High Brass Rods.

Over 1 inch diameter..... 27¢
¼ inch to 1 inch diameter, both inclusive..... 24¢
No. 8 and less than ¼ inch diameter..... 26¢
Smaller than No. 8..... 30¢
Hexagon, Octagon and Square, 2¢ ₩ lb advance over Round Rods.

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 lb.
Western Spelter ..... 5¾¢ @ 6¢
"Bergenport"..... 8¢
"Bertha"..... 7¾ @ 8¢

Zinc.

Duty; Sheet, 2½¢ ₩ lb.
600 lb casks..... 6½¢
Per lb..... 7¾¢

Lead.

Duty: Pig, $2 ₩ 100 lb. Old Lead, 2¢ ₩ lb. Pipe and Sheets, 3¢ ₩ lb.

American	4½¢
Newark	4¾¢
Bar	4½¢
Pipe, subject to trade discount	6 ¢
Tin-Lined Pipe, subject to trade discount	15¢
Block Tin Pipes, subject to trade discount	45¢
Sheet, subject to trade discount	6¾¢

Solder.

½ @ ½ (Guaranteed)..... 14½¢
Extra Wiping..... 12½¢
The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson..... ₩ lb 20 ¢
Hallett's..... " 18½¢

Fittings.

Cast Iron Fittings, Black and Galvanized..... 75&10 %
Cast Iron Fittings, Bushings and Plugs..... 80 %
Cast Iron Fittings, Flanges..... 75&10 %
Malleable Iron Bushings..... 80@80&5 %
Malleable Iron Unions..... 70@70&5 %
Malleable Iron American Unions..... 55 %
Malleable Iron Unions, Keystone..... 55 %
Wrought-Iron Nipples..... 75&10 %
Wrought-Iron Couplings..... 70 %
Wrought-Iron Long Screws..... 70@70&5 %
Casing Fittings..... 60 %
Malleable Iron Fittings..... 40@40&5 %

Valves, Cocks, &c.

Iron Body Valves..... 70 %
Throttle Valves, Iron Body..... 70 %
All-Iron Valves..... 65 %
Compression Gauge Cocks..... 60 %
Mississippi Gauge Cocks..... 60 %
Register Gauge Cocks..... 65@65&10 %
Air Cocks and Radiator Air Cocks..... 65@65&10 %
Steam Gauge Cocks..... 60 %
Oil Cups, Plain, Elbow, new pattern, T and Lever Handle..... 65@65&10 %
Globe Oil Cups..... 55 %
Common Lubricators..... 65@65&10 %
Lubricators with Air Cocks..... 65@65&10 %
Iron Body Lubricators..... 60 %
Steam Whistles..... 65 %
Whistle Valves..... 65 %
Water Gauges..... 65 %
Brass Expansion Joints..... 55 %
Pump Valves..... 55 %
Soldering Unions..... 65 %
Soldering Nipples..... 70 %
Brass Unions (Union Joints)..... 65 %
Radiator Nipples..... 60 %
Fusible Plugs..... 60 %
Oil Pumps..... 55 %
Self-Acting Air Valves..... 65 %
Vacuum Valves..... 55 %
Steam Swing Joints..... 55 %
Iron Strainers..... 55&10 %
Jenkins' Iron Body Valves, except Gate Valves..... 60&10 %
Jenkins' All-Iron Valves, except Gate Valves..... 60 %
Jenkins' Iron Body Gate Valves..... 55 %
Jenkins' All-Iron Gate Valves..... 55 %
Iron Cocks, all Iron..... 65 %
Iron Cocks, with Brass Plugs..... 65 %
Brass Globe, Angle and Cross Valves..... 65 %
Brass Globe Valves, Finished..... 45 %
Brass Globe and Angle Valves, hose outlet..... 65 %
Brass Garden Hose Valves..... 65 %
Brass Caps for Hose Valves..... 60 %
Brass Horizontal, Vertical and Angle Check Valves..... 65 %
Brass Safety Valves..... 65 %
Brass Safety Valves, low pressure..... 65 %
Brass Safety Valves, low pressure, with balance weight..... 65 %
Brass Butterfly Valves..... 55 %
Brass Throttle Valves..... 55 %
Brass Radiator Valves..... 65 %
Brass Radiator Valves, Jenkins'..... 65 %
Brass Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..... 65 %
Brass Jenkins' Gate Valves..... 50 %
Brass Steam Cocks..... 60 %
Brass Gas, Meter and Union Meter Cocks..... 60 %
Brass Fittings, Rough..... 60 %
Brass Fittings, Finished..... 25 %
Brass Bushings..... 60

Plumbers' Brass Work.

Ground Key Work, Rough..... 60 %
Ground Key Work, Finished..... 55 %
Compression Work..... 60@60&5 %
Compression Work, Grundy, Heavy Pattern..... 55 %
Chain Stays..... 60 %
Basin Plugs..... 60 %
Sink or Bath and Wash Tray Plugs..... 60 %
Basin Clamps..... 55 %

FRENCH GLASS.

Per Box 50 feet.

	Sizes	Single. 1st.	2d.	3d.	4th.
		E F H	I E H	H H	H B
25	6 x 8 to 10 x 15	$10.50	$9.00	$8.50	$8.00
40	11 x 14 to 16 x 24	11.50	10.75	10.25	9.75
50	18 x 22 to 20 x 30	15.50	14.00	13.00	12.50
54	15 x 36 to 24 x 30	16.50	15.00	13.50	..
60	26 x 28 to 24 x 36	17.75	16.25	14.75	.....
70	26 x 36 to 26 x 44	19.00	17.50	15.25	.....
80	26 x 46 to 30 x 50	21.00	19.50	17.00	....
84	30 x 52 to 30 x 54	22.00	20.25	18.00	.....
90	30 x 56 to 34 x 56	23.00	21.25	19.00	.....
94	34 x 58 to 34 x 60	24.00	22.75	21.00	....
100	36 x 60 to 40 x 60	26.50	24.50	23.00	....